AUTOMOTIVE INDUSTRIES
with AUTOMOBILE

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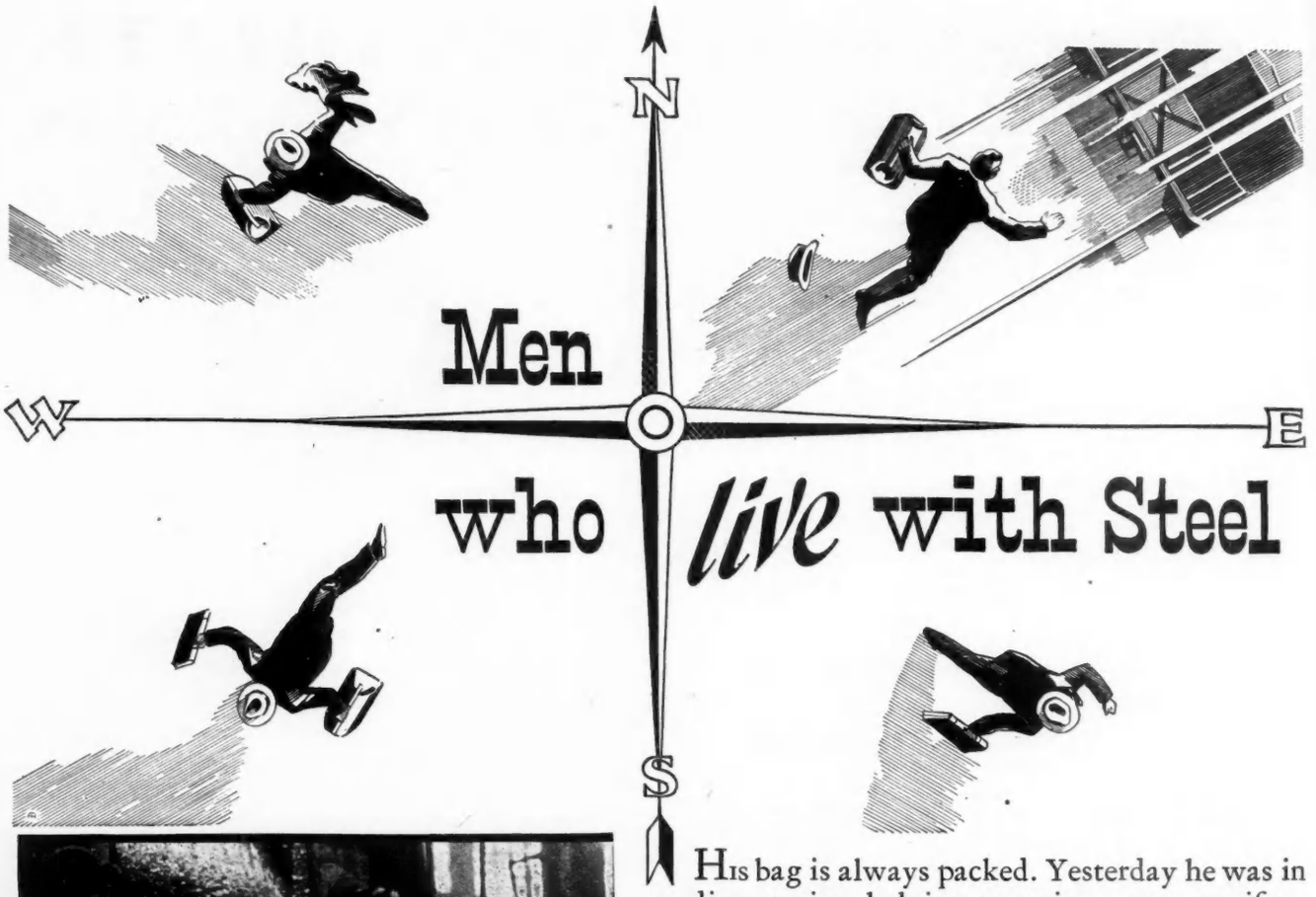
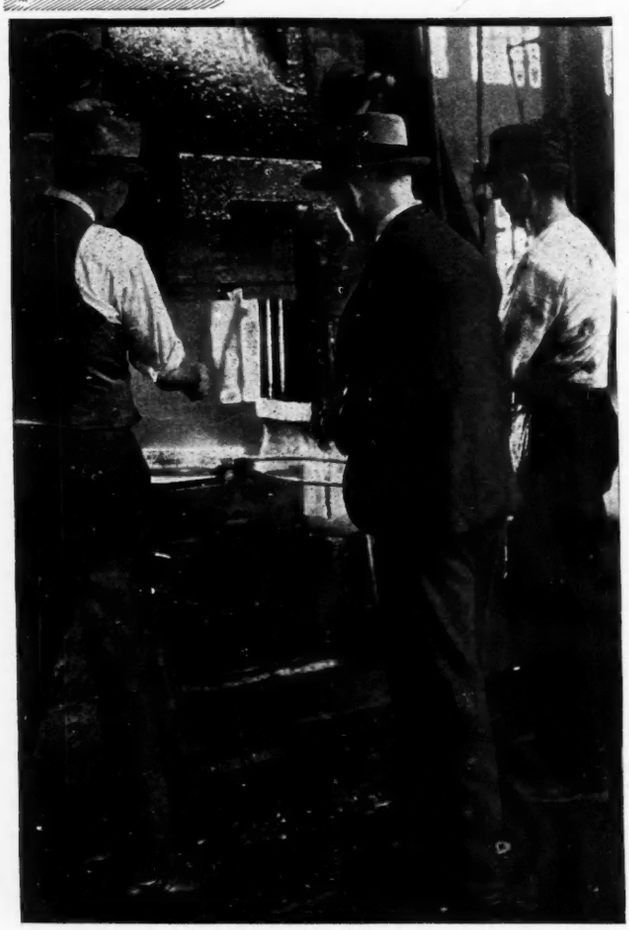


Men who *live* with Steel



His bag is always packed. Yesterday he was in a distant city, helping to write a new specification . . . This afternoon he's out in the laboratory, checking up some special heats . . . Tonight he'll hop a sleeper to a customer's plant, where an urgent heat-treatment problem awaits him.

Tomorrow . . . who knows? It's all in the life of a Bethlehem contact metallurgist.

The ever-widening use of highly-specialized steels has led to a newer and closer relationship between steel-maker and user. Bethlehem contact metallurgists are liaison officers between the men in the mills where alloy steels are made, and the men who use these steels. They supply the *follow through* so necessary to realize the full possibilities of fine steels.

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BETHLEHEM STEEL

BETHLEHEM *fine* ALLOY STEELS

AUTOMOTIVE INDUSTRIES

Vol. 69, No. 3 • THIRTY-FIFTH YEAR • July 15, 1933

First Half Record Breeds Second Half Optimism

by Don Blanchard

Editor, Automotive Industries

Normal seasonal influences not being discounted as factories hold balance between sales and production—dollar volume forges ahead of last year in May and June

THE automotive industry enters the second half of the year encouraged by the phenomenal upswing in production in the second quarter and an apparent increase in retail dollar volume during May and June, and with high hopes that it will exceed 1932 output by a substantial margin.

While the prevailing sentiment among the industry's leaders is decidedly optimistic, there is no disposition to discount the uncertainties which obscure the outlook nor to ignore the fact that a seasonal reaction in sales is long overdue. Moreover, first new model introductions are only about 60 days off, and, during the changeover period, production naturally is expected to decline. Consequently, reports that a number of important producers have reduced their schedules for this month about 20 per cent from June are occasioning neither surprise nor disappointment. The industry is merely holding to the sound policy of making retail sales, as well as they can be forecast, the barometer for manufacturing operations. While, if the high sales levels reached in June are maintained in July, the industry may face an over-sold condition, certainly that is a more desirable situation under existing circumstances than on over-produced position.

Enough facts are now available to permit a fairly accurate appraisal of the industry's record during the first half of 1933, and it is an amazing one considering that during the banking crisis estimates for the year's output as low as 750,000 units were made.

The most important indicator is, of course, net profit. While there is an utter lack of official data on this point, unofficial reports indicate that the industry's earnings during the second quarter, in many cases, were even more satisfactory than its production record.

Production during the first six months of the year totaled 1,030,000 cars and trucks approximately a gain of 12.5 per cent over 1932. Of even greater importance is the fact that in May and June retail dollar volume ran ahead of last year, a condition which did not prevail earlier in the year.

During the same period exports of motor vehicles exceeded last year's record by about 25 per cent.

How U. S. retail car sales were divided in the first five months—Fig. 1

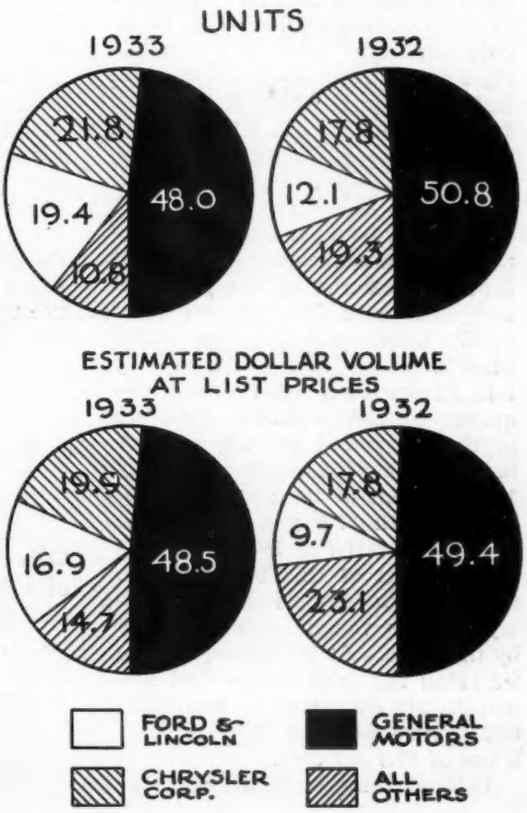


Table I U. S. Registrations of New Passenger Cars and Estimated Dollar Volume by Price Classes—First Five Months of 1933 and 1932

	Units		Per Cent of Total		Per Cent
	1933	1932	1933	1932	Change
Chevrolet, Ford and Plymouth	342,859	289,356	67.6	56.3	+18.8
Others under $750	84,355	42,342	16.6	8.2	+99.3
$750-$1,000	40,059	102,412	7.9	20.0	−61.0
$1,000-$1,500	25,784	48,270	5.1	9.4	−46.6
$1,500-$2,000	6,597	16,316	1.3	3.2	−59.5
$2,000-$3,000	5,201	10,645	1.0	2.1	−51.2
$3,000 and over	2,621	4,356	0.5	0.8	−39.8
Total	507,476	513,697	100.0	100.0	−1.0
Miscellaneous	701	1,176			
Total	508,177	514,873			

	Estimated Dollar Volume		Per Cent of Total		Per Cent
	1933	1932	1933	1932	Change
Ford, Plymouth & Chevrolet	$188,000,000	$170,000,000	54.8	40.9	+10.6
Remainder under $750	55,000,000	29,000,000	16.0	7.0	+89.5
$750-$1,000	35,000,000	89,000,000	10.2	21.4	−60.6
$1,000-$1,500	30,000,000	58,000,000	8.8	13.9	−48.2
$1,500-$2,000	11,000,000	27,000,000	3.2	6.5	−59.3
$2,000-$3,000	13,000,000	27,000,000	3.8	6.5	−51.8
$3,000 and over	11,000,000	16,000,000	3.2	3.8	−31.2
Total	$343,000,000	$416,000,000	100.0	100.0	−17.7

June sales of passenger cars in the United States of about 200,000 brought the total for the first six months to 708,000, which represents a gain of seven per cent over 1932.

Due partly to lower prices, but mostly to a big swing to the lowest-priced cars, however, the estimated dollar volume of domestic passenger car sales at list prices declined nine per cent to about $475,000,000 in the first *six* months. This is the only important index of the industry's activities to show a drop from last year for the first six months. Its significance is offset to a certain extent by lower production costs.

Table I shows that Chevrolet, Ford and Plymouth together accounted for 67.6 per cent of domestic retail passenger car sales in the first *five* months of the year, as compared with 56.3 per cent last year. Other makes listing under $750 increased their percentages of totals from 8.2 to 16.6. As a consequence of this relative expansion in the low-priced market, all cars listing over $750 represented only 15.8 per cent of total sales as contrasted with 35.5 per cent in the first five months of 1932.

The effect of this big swing to the lowest-priced field on the industry's dollar volume also is shown by the table. At list prices domestic retail car sales in the first five months are estimated at $343,000,000 against $416,000,000 last year, a loss of 17.7 per cent.

Table II is more encouraging. It shows similar price class figures for the month of May on a unit and dollar volume basis. It is significant that both units and dollars showed a gain over 1932, 22.1 per cent, and 9.5 per cent respectively.

The chart on the previous page throws some light on the split-up of the domestic retail car sales pie in the first five months, as compared with last year. On the basis of estimated dollar volume, General Motors accounted for 48.5 per cent of the total during this period in 1933, as compared with 49.4 per cent a year ago. Chrysler (including Chrysler, DeSoto, Dodge and Plymouth) got 19.9 per cent against 17.8, while Ford increased his share from 9.7 to 16.9 per cent. All other makers combined, therefore, obtained 14.7 per cent this year, as contrasted with 23.1 per cent last year.

On the unit basis, the General Motors percentage of total dropped from 50.8 to 48 per cent. On the other hand, both Chrysler and Ford increased their shares from 17.8 to 21.8 in the former case, and from 12.1 to 19.4 per cent in the latter. As a consequence the share going to all other makers declined from 19.3 to 10.8 per cent.

Geographically, Fig. 2 shows that the South, with the exception of Virginia but including West Virginia, plus New Mexico, Arizona and California, is ahead of last year in the first five months of 1933. Other states ahead for the year to date are Utah, Montana, Michigan, Illinois and Ohio. Comparison with the map showing the situation at the end of four months reveals that during May 12 states joined the ranks of those which are ahead of last year for the first five months.

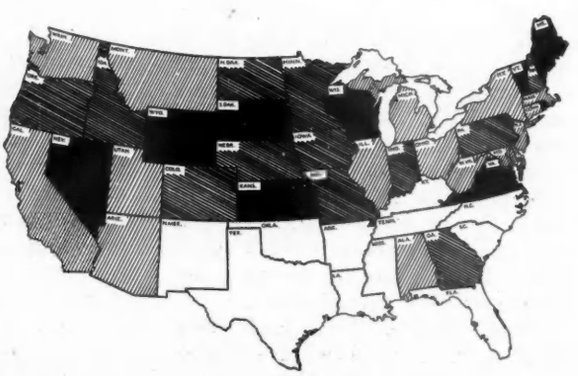


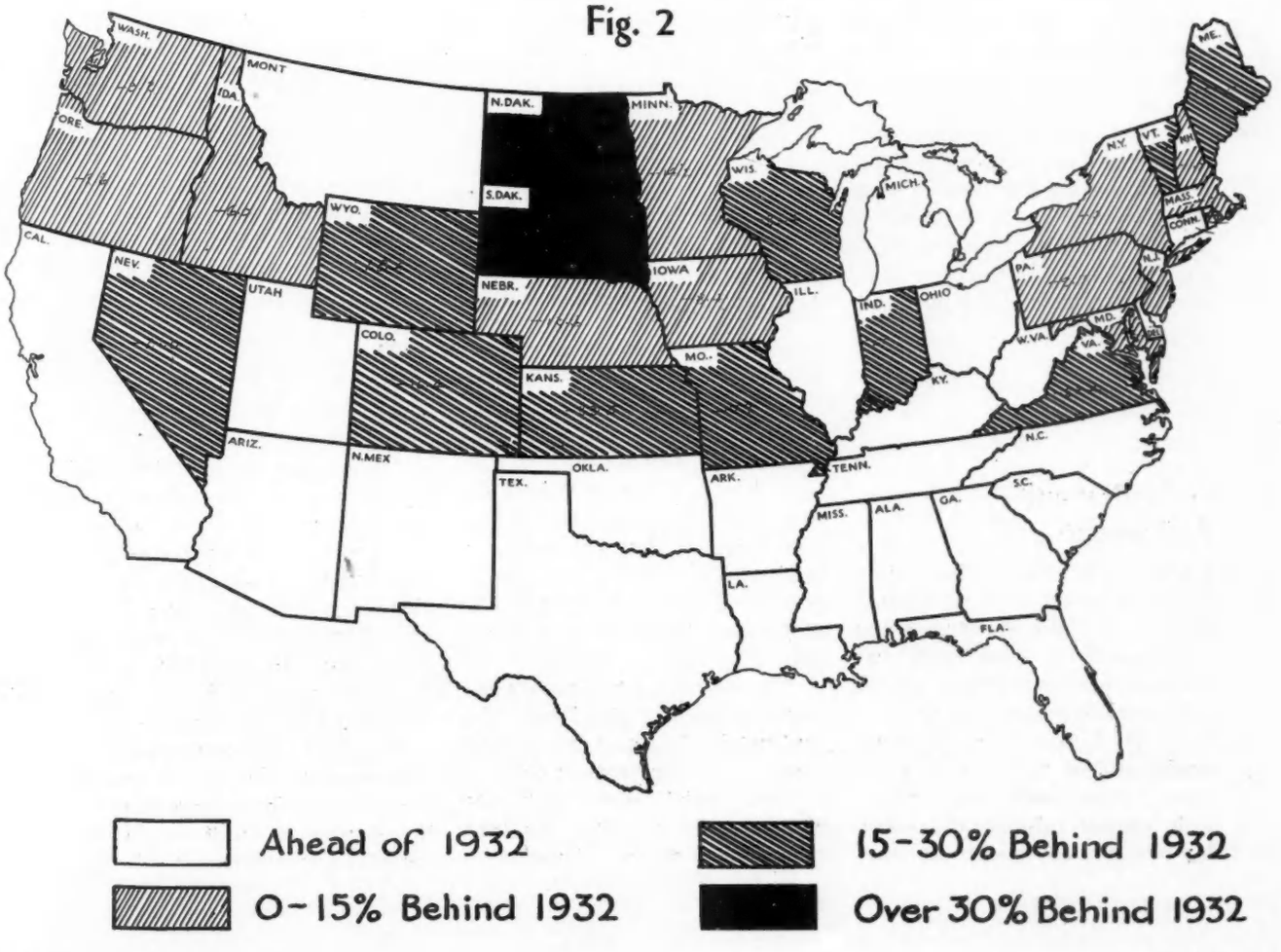
Fig. 1
Only 11 States Ahead of 1932 at the End of Four Months

Table II U. S. Registrations of New Passenger Cars and Estimated Dollar Volume by Price Class—May, 1933, and 1932

			Per Cent of Total		Per Cent			Per Cent of Total		Per Cent
	1933	1932	1933	1932	Change	1933	1932	1933	1932	Change
Chevrolet, Ford & Plymouth	109,813	84,393	68.5	64.5	+30.3	$58,000,000	$50,000,000	55.2	51.0	+16.1
Others under $750	27,549	10,535	17.2	8.0	+161.0	18,000,000	7,000,000	17.1	7.1	+157.0
$750-$1,000	11,633	21,385	7.3	16.3	—45.5	11,000,000	18,000,000	10.5	18.4	—39.0
$1,000-$1,500	7,493	8,877	4.7	6.8	—15.5	9,000,000	11,000,000	8.6	11.2	—18.2
$1,500-$2,000	2,523	3,173	1.6	2.4	—20.5	4,000,000	5,000,000	3.8	5.1	—20.0
$2,000-$3,000	67	1,727	..	1.3	—61.2	.....	4,000,000	..	4.1	....
$3,000 and over	1,051	912	0.7	0.7	+15.1	5,000,000	3,000,000	4.8	3.1	+67.0
Totals	160,129	131,002	100.0	100.0	+22.1	$105,000,000	$98,000,000	100.0	100.0	+7.0

23 States Ahead of Last Year At the End of Five Months!

Fig. 2



JUST AMONG OURSELVES

Rate Regulation Imminent?

A PROVISION making it an unfair trade practice to sell for less than cost apparently is to be a necessary part of every code approved in Washington under the Industrial Recovery Act. As a corollary of that provision, uniform cost accounting throughout an industry would seem essential.

It is interesting to speculate about the possible effect of these facts on the for-hire truck carriers who thus far have fought off attempts at national rate regulation. It is conceivable that rate regulation might come upon them from behind through this new legislation.

In any case, the proposed formation of a national motor truck association by the various state associations now in existence is a constructive step toward active cooperation with the new Government Industrial Recovery Administration.

* * *

A Permanent Partnership

FEW trade association managers probably are so happily qualified by both experience and temperment to cope with the practical problems raised by the Industrial Recovery Act as Hermann H. Lind of the National Machine Tool Builders Association. Consequently, we listened with special interest the other day to his comments on this radical new legislation. One statement in particular gave us pause:

"The bill is called an 'emergency bill,'" he said, "experimental in nature and limited to a period of two years. However, no one takes seriously the two year angle. Even if it were declared off today, the three months of intensive study and discussion of the relation of trade association activity to industry have brought about new conceptions of the possibilities of the trade association for doing good. If the cooperation of industry and the government succeed in any reasonable way, we may expect to have it with us in some form always."

* * *

Articulate Industrialists

LIND believes, too, that the operation of this new legislation will result in more active participation in public life by competent business men.

"Since it is the expressed desire of the President not to govern business, but to become a partner in business," he pointed out, "it behooves business to make itself heard in the partnership.

"To work out the purposes and aims of the Act effectively," he continued, "business must take a more active interest in politics. Interest must start with the primaries, to see that the best type of men are nominated. . . . It must then follow through to secure election of only the strongest of those nominated. Contact must then be maintained so that those who make the laws are familiar at all times with all the facts that bear on the welfare of their constituents."

Now just one more interesting comment from the same source and we'll pass on to other topics:

"We have heard much talk of rugged individualism having run its course. This seems to me an overly strong statement. I prefer to think it is the blind, selfish type of individualism that is out, and that individualism of a progressive and productive character will remain to carry us forward as it always has done in the past."

* * *

When the Time Sales Ratio Gains

ONE place to look for signs of returning confidence will be in the figures showing the number of new cars sold on an instalment basis. While entirely comprehensive figures aren't available, the data are quite detailed enough to prove conclusively that the proportion of new cars sold on time has decreased steadily as the depression wore on.

This proportion still was less during the first four months of this year than during the first four of last.

Despite the skeptics, statistical evidence proves that most men are honest; they don't contract debts for which they don't expect to pay. That's why, during the depression the proportion of cars bought for cash went up. Uncertain about stability of employment, people didn't buy until they actually had the money.

Increases in proportion of time sales will be a good indication of confidence returning to the hearts—as well as to the speeches—of Americans.—N.G.S.

Advertising Today Is a Patriotic Duty

So says Our President and so says General Johnson. It will aid materially in boosting business up the hill

by Julian Chase
Directing Editor, Chilton Co.

NOW, in the month of July, 1933, and in the months that will follow until business recovery is an established and undisputed fact, there is added to the practical advantage of well placed and scientifically planned advertising a plain, patriotic duty, the performance of which both directly and indirectly will pay dividends to the advertiser. This is true whether it be advertising to the manufacturing, the distributing or the consumer markets.

In a letter to Edgar Kobak, President of the Advertising Federation of America, President Roosevelt said—we quote from that letter:

WHITE HOUSE,
Washington

June 15, 1933.

. . . "Moreover, I wish you would say that I hope the high standards which have made good advertising an economic and social force of vital importance to us all will be continued. Your cooperation will be valuable to the restoration of improved levels and flow of trade. It also will help business and industry to return to better times. By doing these things you will be serving your country and government."

Signed

FRANKLIN D. ROOSEVELT.

And here is what General Hugh S. Johnson wrote to Mr. Kobak:

Washington, D. C.
June 22, 1933.

My dear Mr. Kobak:

"Advertising is certain to be an important factor in the new industrial relationship established under the terms of the Act. In its effects, the law will bring to the fore the sales problems of the manufacturer and will emphasize the importance of an accurate knowledge of his markets. I believe, too, that research in industry will enjoy even greater importance under the provisions of the law. Good advertising will become more essential than ever. It will be in a position to help the business executive avoid those wasteful and expensive practices in selling which so often add needless costs to needed products. Good advertising is opposed to senseless price cutting and to unfair competition. These are two business evils which we hope to reduce under the new plan of business administration.

"Constructive selling competition will be as strong as ever and there will be great need for aggressive sales and advertising efforts. The only kind of competition that is going to be lessened is the destructive, cut-throat kind of competition which harms industry and the public as well. There should be more competition than ever in presenting quality products to consumers and in selling those products. What we are going to need more than ever is energetic, intelligent, honest efforts to sell goods to people who are to use them.

"No one group can achieve the results sought under this new law. We all must work together. Advertising must help business and the government alike to bring about the new order of things as quickly as possible. In doing this, of course, we will be helping to bring trade back to normal volume. Above all, we shall be working toward the reemployment of millions of our fellow Americans."

Signed

HUGH S. JOHNSON,
Administrator, National Industrial Recovery Act.

If some may wonder why an editor steps out and has his say on the subject of advertising, let it be pointed out that *Automotive Industries* is an industrial publication dealing not only with the engineering and production problems of the industry which it serves but also with the problems of general management and marketing.

Advertising is an essential part of a manufacturer's selling program. For the fullest development of any manufacturing organization's selling possibilities, advertising is a necessity—a sound economic business factor. We need offer no justification at any time, and particularly now, of the propriety of discussing this subject editorially, especially to those who understand what intelligent advertising is and does. Today, to do so, is an obligation.

One of the more important factors contributing not only to the rapidity of business decline but also to the depths to which business activity sunk was the extent to which advertising was curtailed in an effort to conserve working capital. However, discouragement was augmented by the disappearance of the advertising of industrial leaders. The absence from its accustomed places of the advertising of any outstanding company was, in itself, a most clearly written and most boldly displayed advertisement reading "Our Business is Rotten." Curtailment of advertising was undoubtedly necessary in the judgment of boards of directors, but the curtailment was carried so far as to be destructive of its purpose. Workers in factories and shops were thrown out of jobs, to some extent at least, because what was considered a partial cure for the ills of individual companies proved to be another and most potent means of spreading contagion.

Advertising—well planned advertising, placed in intelligently selected media—can aid materially now in boosting business up the hill. So says President Roosevelt; so says General Johnson and so say all those others who know the real function and effectiveness of advertising well done.

The Metallurgists' Contribution to

IN a recent article in these columns the writer briefly reviewed contributions of the parts industry to the development of the American automobile. Important contributions were made also by manufacturers or suppliers of "raw materials," especially metals and alloys, and developments in the field of metallurgy which have benefited the automobile industry are the subject of the present article.

Few people probably realize that the alloy steel industry was developed chiefly to meet the need of better materials of construction for automobiles than were available on the market at the beginning of the century. At the inception of the industry, the use of alloy steels in machine construction was practically unknown. Nickel steel had been used for some time for armor plating and locomotive axles, and some development work had been done looking toward its use for bicycle tubing and bicycle chains, but it was not considered as a standard material for machine construction.

Gears and transmission shafts of the early automobiles were made of machinery steel or medium-carbon steel, and with the heavy flywheels then in use on single-and double-cylinder engines, and grabbing clutches, these parts often were overstressed and failed. The late Elwood Haynes, who besides being one of the pioneers of the American automobile industry, was also a professional metallurgist, was probably the first to use nickel steel in automobile construction, at least in this country.

Chrome-Nickel Steel

A few years later chrome-nickel steel came to be recognized as a superior material for highly stressed parts and found wide application in automobiles of the better class. Its great hardness and consequent poor machinability after heat treatment made its use rather expensive, and this led to a further search for promising alloys. One of the first developments was vanadium steel, which was widely used in low-priced automobiles during the decade preceding the war. The effects of vanadium on the physical properties of steel are of an indirect nature. Such alloying elements as chromium and nickel change the grain structure of the steel, thereby increasing its tensile strength and hardness directly. Vanadium, on the other hand, acts chiefly as a deoxidizer and adds to the strength and toughness of the steel by eliminating impurities in it. It does not harden the steel and impair its machinability, hence its use adds comparatively little to the cost of the finished product.

For a considerable time the American steel industry was rather apathetic toward the automobile. It was accustomed to supplying steel in large "tonnages" to the railroads and the building industries, in comparison with which the needs of the automobile industry during the development period were insignificant. A great deal of the alloy steel used in the high-grade cars of that period was imported from abroad. A number of the smaller steel companies, however, soon realized the opportunities which the development of the automobile would afford and began to develop alloy steels for the industry.

One of the latest developments in special steels for highly stressed parts of automobiles is molybdenum or chrome molybdenum steel, which came into use after the war. It has been used largely in aircraft construction and also to some extent in automobile manufacture in the form of thin-walled tubes which when suitably heat-treated have a very high ultimate strength in tension. Chrome molybdenum steel is a favorite material also for rear axle drive shafts, and this is probably its principal application in the automobile field at the present time.

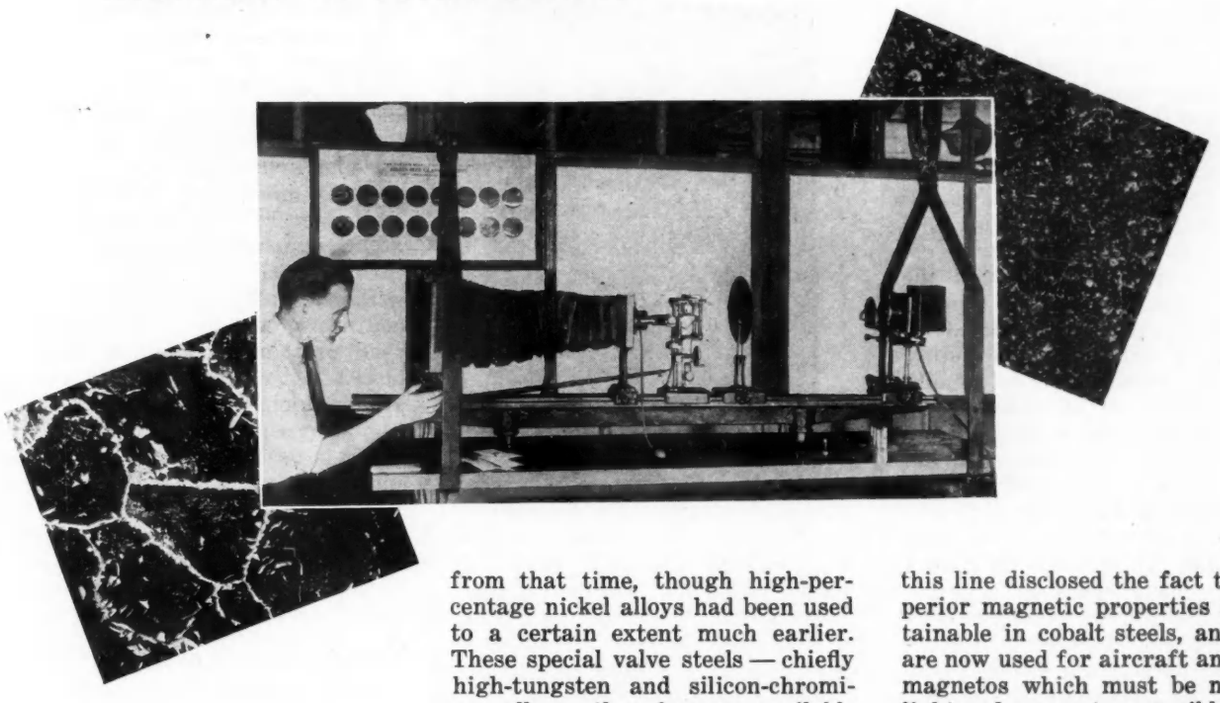
Alloy Spring Steels

In addition to steels for structural and transmission parts, many alloys were developed for special parts such as chassis springs. The first alloy steel widely used for this purpose was silicon-chromium steel, and later chrome-vanadium steel came in. It is not the intention to convey the impression here that all of these steels were developed solely for automobile purposes. However, whereas in the early years of the industry its consumption of steel had been so small that the large steel makers disdained to cater to its special needs, in the course of a little more than a decade it had

Automotive Development

How the suppliers of metals and alloys have helped in the progress of the automotive industry by providing improved materials of construction

by P. M. Heldt
Engineering Editor, Automotive Industries



grown to such size that as a potential market for alloy steels it loomed larger than all other industries combined, hence automotive requirements were the chief incentive behind many developments in steel production.

Poppet valves in the early automobile engines were either forged of machinery steel or made with a machinery steel stem and cast-iron head, but when engine speeds were increased there soon arose a demand for materials that were more resistant to scaling and pitting at high temperatures. The need for better materials became particularly urgent during the period of intense development of aircraft engines during the war, and the use of special valve steels practically dates from that time, though high-percentage nickel alloys had been used to a certain extent much earlier. These special valve steels — chiefly high-tungsten and silicon-chromium alloys—thus became available to designers of automobile engines, which is probably one of the reasons for the comparatively rapid increase in the speeds of passenger-car engines from about 1920 on.

Magnet Steels

Another line of steel production that has seen considerable development as a result of automotive requirements is that of magnet steels. The original magnet steels were tungsten steels, but during the war, when tungsten was used in large quantities for tool steels and was scarce and expensive in consequence, research showed that quite satisfactory results could be obtained from chromium steels, and it is the writer's understanding that these steels are now largely used in the magnets of ignition magnetos. Further research along this line disclosed the fact that superior magnetic properties are obtainable in cobalt steels, and these are now used for aircraft and other magnetos which must be made as light and compact as possible.

Along with the subject of alloy steels goes that of heat treatment, for alloy steels are little better than carbon steels unless they are suitably heat treated. While certain forms of heat treatment, such as annealing, hardening and tempering, had long been practiced in the metal industries, chiefly in connection with cutting tools, they were always referred to by their specific names, and the generic term "heat treatment" came into use only coincident with the adoption of alloy steels in automobile production. The same as in the case of alloy steels, an immense amount of research work was devoted to heat treatment, and the results achieved are reflected by the fact that whereas with the early automobiles, with engines of from 5 to 20 hp., no end of trouble was experienced from

breakage and premature wear of parts, today cars of little greater bulk and weight, with engines of ten times the horsepower, run from one end of the year to the other practically without giving their owners cause for worry. Improvement in materials, of course, is only one of the factors that contributed toward this result.

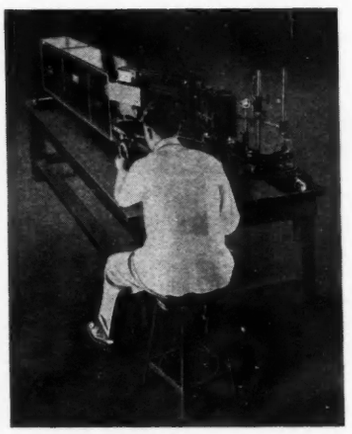
Nitriding Fills Need

Nitriding, one of the latest developments in metallurgical processes, also met a special need in the automobile industry. It gives a greater surface hardness than is obtainable by any other process, and it causes less distortion than other processes of surface hardening in the parts to which it is applied, hence it lends itself particularly to the hardening of gears, which, if accurately cut while in the unhardened state, will not be distorted and rendered noisy by the hardening process. The process has been applied also to parts which must combine surface hardness with resistance to corrosion, and abroad it is being used to some extent for cylinder liners. In the numerous papers on this process which have been contributed to meetings of metallurgical societies, its automotive applications usually have been specially stressed.

Introduction of the nitriding process has led to the commercial development of a new class of alloy steels known as nitralloys. A common characteristic of all grades of nitralloy is a small aluminum content, which seems to promote the combination of nitrogen with the elements of the alloy. In addition to its hardness, a nitrided surface has the advantage of superior resistance to corrosive influences, and nitrided steel shafts have been used for water pumps, which must combine both characteristics in order to give trouble-free service over long periods.

During the past two decades an entirely new class of alloy steels, known as rustless or stainless steels, have been made available to the automotive industry. These are chromium and nickel-chromium steels, but their contents of chromium and nickel are far greater than those of the ordinary nickel and nickel chromium steels. The true stainless steel, which contains from 12 to 14 per cent of chromium, is used principally for cutlery purposes, but the term "stainless" is now applied to quite a variety of alloys, some of which have found applications in the automobile industry. Among these is the so-called 18-8 alloy, a steel containing 18 per cent chromium and 8 per cent nickel.

These high-chromium and high-nickel-chromium alloys have three different properties which make them attractive to designers of different types of vehicles, structures and machinery. Their outstanding feature is their high resistance to corrosive influences even at high temperatures. Then, they take a high polish which together with the attractive color of the alloys, provides an excellent permanent finish. Some of the alloys can be given exceedingly high mechanical properties by cold working, so that they rival and even excel



some of the light alloys with respect to the strength/weight ratio.

Just what the ultimate field of stainless steels in automobile construction will be it is impossible to say at this time. Their greatest chance seems to lie where all three of their outstanding properties—non-corrodability, high finish, and great mechanical strength—are important. For some time stainless steel was used for radiator shells by one of the largest makers, but a change in style to lacquer finish for radiators put an end to this application. At present stainless is used in automobile manufacture in such parts as medallions on bumpers, headlamp rims, hub caps, fuel-tank caps, brackets and body moldings, in all of which applications its attractive, non-tarnishing finish is an important consideration. Hood hinges are also made of the material to prevent rusting up during periods of non-use.

It is significant, however, that in aircraft and lately also in railcar and motor bus construction the 18-8 grade of stainless steel is used for structural members on account of its high mechanical qualities.

A new welding process has been developed which is so rapid in action that although the surfaces subjected to the welding heat are united by fusion, the adjacent metal is not heated sufficiently to cause it to loose the high tensile strength which has been imparted to it by cold working. It is not impossible if high acceleration continues to be a dominant feature in the automobile market, or if changes in the fuel market should make it desirable to reduce engine power without sacrificing acceleration, that stainless steel will find a place for important structural members of passenger cars.

Important improvements have been made in the metallurgy of cast iron in recent years, which were taken advantage of first in the production of cylinder blocks, pistons and piston rings, and latterly in the production of brake drums, camshafts and other parts. The mechanical properties of cast iron can be materially improved by the addition of small proportions of nickel and chromium, and—what is more important in most instances—such additions increase the resistance of the material to wear by abrasion without materially changing its machining qualities. Alloy iron is used particularly for the cylinder blocks of commercial-vehicle engines which, because of intensive use, must show a long mileage life, but it is used also in passenger-car engines in the higher-priced class. Nickel and chromium are added to cast iron to refine the grain, and to harden and strengthen the iron without impairing its machining qualities.

Vanadium Acts as a Purifier

Other alloying elements also have been added to cast iron, including vanadium, molybdenum and titanium. The same as in steel, vanadium acts as a purifier and is not present in the finished castings in any considerable proportion. One of the most valuable properties of molybdenum cast iron seems to be that it minimizes the socalled "growth" of cast iron or distortion of the castings. Molybdenum is claimed also to increase the wear resistance, impact strength and compressive strength of cast iron. It is said to increase the fluidity of the iron, so that castings with comparatively thin sections can be successfully poured. Where molybdenum is used in cylinder irons it is generally associated with chromium or nickel or both. Molybdenum irons are used also in brake drums and in camshafts.

Recently the use of titanium in cast iron has been advocated. Titanium is said to increase the strength of the iron and to result in a finer division of graphite particles.

Cast iron metallurgy has reached a point where it is now possible to make use of the material for the camshafts of internal combustion engines, the cams of which must possess great hardness to resist wear. In fact, development work is under way looking toward the use of cast iron for crankshafts. Built-up crankshafts, of which the part of the crank arms is taken by cast iron flywheels, have been widely used in motorcycle engines, but the present project contemplates the use of cast iron for the main bearing journals and the crankpins as well. Cast material would seem to offer particular advantages for the two-plane crankshafts of eight-cylinder 90-deg. V engines in which large counterweights must be provided, since the indexing operation is eliminated and the counterweights can be cast integral, besides which the crank arms can be replaced by disks which are carried in bearings, which adds materially to the permissible length of the crankpins, which must carry two bearings side by side.

Zinc Alloys

Zinc is used in the automobile industry almost entirely in the form of alloys (brass and die casting alloys). According to the National Automobile Chamber of Commerce, 9 per cent of the total production of zinc in the U. S. finds its way into motor vehicles. Most of this undoubtedly goes into die castings which are used for such parts as magneto bases and covers, carburetor bodies, fuel pumps, windshield wipers and cowl ventilators. A great deal of the body hardware of passenger cars also is in the form of zinc-alloy die castings, although, since this is always plated, it is not readily recognized.

Die casting is a process which lends itself to the economical production of intricate parts. It is economical particularly if large numbers of parts of the same design are required, as the equipment is relatively expensive. The economy of the process is dependent to a considerable extent on the fact that parts can be cast close to size and require no machining. Originally only metals with very low melting point could be die-cast successfully in complicated forms, the chilling effect of the metal mold preventing the successful use of metals or alloys with higher melting points. These low melting-point alloys usually have little strength and die castings made of them therefore were of limited use. The efforts of the die casting industry therefore have been directed toward the development of processes and alloys which could be cast successfully although they had greater mechanical strength. In the development of the alloys the industry has had the whole-hearted support of the metal industry.

Zinc alloys for die casting are now available which show a tensile strength of from 30,000 to 50,000 lb. per sq. in. These alloys usually contain moderate proportions of copper, aluminum, and magnesium. Other metals which are also likely to be present include iron, lead, tin and cadmium, but these are regarded as impurities and the specifications place a limit on the maximum permissible content.

The ease with which intricate and attractive forms can be shaped by die casting is mainly responsible for the wide use of zinc-base alloys in automobile production. Radiator caps and radiator ornaments are a good example of the advantageous use of this material. It is stated

on good authority that two of the largest selling makes of passenger-cars have more die castings in their 1933 model than in any previous one.

Aluminum has played a very important part in the development of the automobile. During the early years of the industry crankcases and transmission cases were largely made in the form of aluminum castings, and in some cars the rear axle center housings also were of cast aluminum. During the war period there was a gradual shift to cast iron crankcases, probably as a result of the general boost in prices which affected aluminum the same as all other raw materials. After the war only high-priced cars carried engines with aluminum crankcases. But as the uses of aluminum alloys for machinery housings in the automotive industry declined, its use for other purposes increased. Today a very large proportion of all passenger car engines are fitted with aluminum alloy pistons, and some also carry aluminum-alloy connecting rods and cylinder heads, inlet manifolds, etc. Taking the very considerable increase in production since prewar days into account, probably more aluminum is used in automobiles today than was used when most engines still had their crankcases cast of the light alloys.

Aluminum as a Piston Material

Aluminum makes a very good material for the pistons of high-speed engines because of its low specific gravity, which reduces the inertia forces on the reciprocating parts, and also on account of its high thermal conductivity, which keeps down the temperature of the piston crown, prevents hot spots and thus permits of the use of high compression ratios. The one disadvantageous feature of aluminum as a material for pistons is its high coefficient of heat expansion, which makes it necessary, with the conventional design of piston, to provide an exceptionally large clearance, which tends to give trouble from oil pumping and piston slap when the engine is relatively cold.

The advantages offered by pistons of light alloys are so important, however, that this problem was attacked with great energy and a number of solutions have been arrived at which make the aluminum alloy piston a thoroughly practical component. Some of these solutions are based on design features and others on metallurgical features. Among the latter may be mentioned the production of aluminum alloys of high silicon content which have a coefficient of heat expansion not very much greater than that of cast iron. Incidentally, alloy cast irons with high nickel content have been produced which have a coefficient of heat expansion considerably greater than that of

plain cast iron, and there is very little difference between the coefficients of heat expansion of the high-silicon aluminum alloy and the high-nickel alloy cast iron. Mechanical solutions of the problem arising from the difference in the expansion coefficients of the conventional piston alloys and plain cast iron are represented by the split-skirt and the invar-strut types of aluminum-alloy pistons.

The latest use to which aluminum is put in passenger car engines is as a material for cylinder heads. There, the same as in piston crowns, the high heat conductivity of aluminum prevents the formation of hot spots and increases the maximum useful compression ratio.

In Commercial Vehicle Bodies

Aluminum has made great headway in the commercial vehicle field in recent years as a result of a realization on the part of manufacturers and operators that any saving in weight which can be effected by the substitution of light alloy for heavier material permits of an equal increase in payload. Aluminum-alloy tanks for tank trucks made their appearance only a few years ago, yet today they are a quite familiar sight on our highways. Aluminum in the form of sheets and shapes also has found wide application in the fabrication of bodies for dump trucks, buses, etc., where the same principle holds. Trailers are being manufactured of the light alloys today, and arrangements have been made for the production of vehicle frames of pressed aluminum-alloy members, though not much has been done as yet in this direction.

While at first thought it strikes one as peculiar, it is a fact that the use of the more expensive light alloys offers greater advantages in the case of commercial vehicles than in that of private passenger cars. In the latter the maximum speed is dependent far more on air resistance than on weight, and a reduction in weight would yield a gain with respect to acceleration only, whereas in the less speedy commercial vehicles a reduction in weight results in gains in both speed and acceleration.

Where still lighter material than aluminum alloys is desired, magnesium and its alloys are now available for industrial purposes. The specific gravity of metallic magnesium is only 1.74 and that of its alloys is little greater, since the chief alloying element is aluminum. Thus the weight of a casting in magnesium alloy is only about two-thirds as great as that of the same casting in aluminum alloy. This light weight is of great advantage in the reciprocating parts of high-speed engines, and also in machinery housings and cover plates. Magnesium pistons have been used in both motorcycle and airplane engines. At first some trouble was experienced from insufficient hardness of the metal, which resulted in rapid wear particularly at the ring grooves; but it has been found possible to increase the hardness and wear resistance of the alloys materially by cold working.

Crankcases of magnesium alloy have been used particularly abroad. Owing to the limited strength of these alloys, crankcases cast in them must be so designed that the stresses due to gaseous pressure are taken on "through" bolts or else subject the magnesium to compression stresses only. The Packard aircraft Diesel is an American engine with magnesium crankcase. In this case the substantially cylindrical crankcase is surrounded by two rings or hoops of alloy steel which by means of turnbuckles are tightened up until the case is subjected to compressive stresses greater than the tensile stresses which would result from the combustion pressure in one of the cylinders, so that the light material is under compression at all times.

A Diesel-type commercial vehicle engine recently developed in England also has a magnesium-alloy crankcase, and in this case the gaseous pressures are taken on "through" bolts which pass through the bottom flange on the cylinder block, the crankcase, and the main bearing caps, so that the resulting tensile stresses are taken on the bolts.

It is quite possible that light alloys such as those of magnesium will be used more extensively in Diesel than in spark-ignition engines, for the reason that the former type so far does not develop quite as high a b.m.e.p. as the latter, hence must be somewhat heavier for the same output even if the operating speed is the same, and there naturally will be an inclination to overcome this handicap by the use of lighter material.

Throughout the whole history of the automotive engine the tendency always has been to increase the specific output of engines, until now in aircraft racing engines an output of more than one horse power is obtained per pound of engine weight. This constant stepping up of output naturally resulted in increased stresses on the materials of all working parts, and particularly on the bearing materials. Any increase in power output, as a rule, results not only in greater unit pressures on the bearing surfaces, but also in higher temperatures of the oil films, so that the margin of safety of the bearing is being reduced from both ends, as it were.

There may not have been any revolutionary developments in bearing materials, as tin-base white metal alloys are still being used, but much research work has been devoted to bearing alloys and there is no doubt that great improvement in such alloys has resulted therefrom. The fact that bearings stand up satisfactorily under the speeds and unit pressures current in modern high-speed automotive engines supports this view.

To Revise Bearing-Alloy Specifications

AT the annual meeting of the American Society for Testing Materials, held at Chicago June 26-30, a paper on "The Effect of the Addition of Lead on the Hardness of Certain Tin-Base Bearing Alloys at Elevated Temperatures" was presented by John N. Kenyon. This paper presented first-hand evidence on matters regarding which there have been decided differences of opinion in the past, and indicated that the addition of lead improves the physical properties of certain alloys which may be much more cheaply produced than alloys of highly restricted lead content. As a result of the work and findings covered in this paper, Sub-Committee IV on White Metals—Tin, Lead and Zinc—plans to amend the specifications for white-metal bearing alloys, commercially known as babbitt metal, as far as alloys Nos. 1, 2 and 3 are concerned.

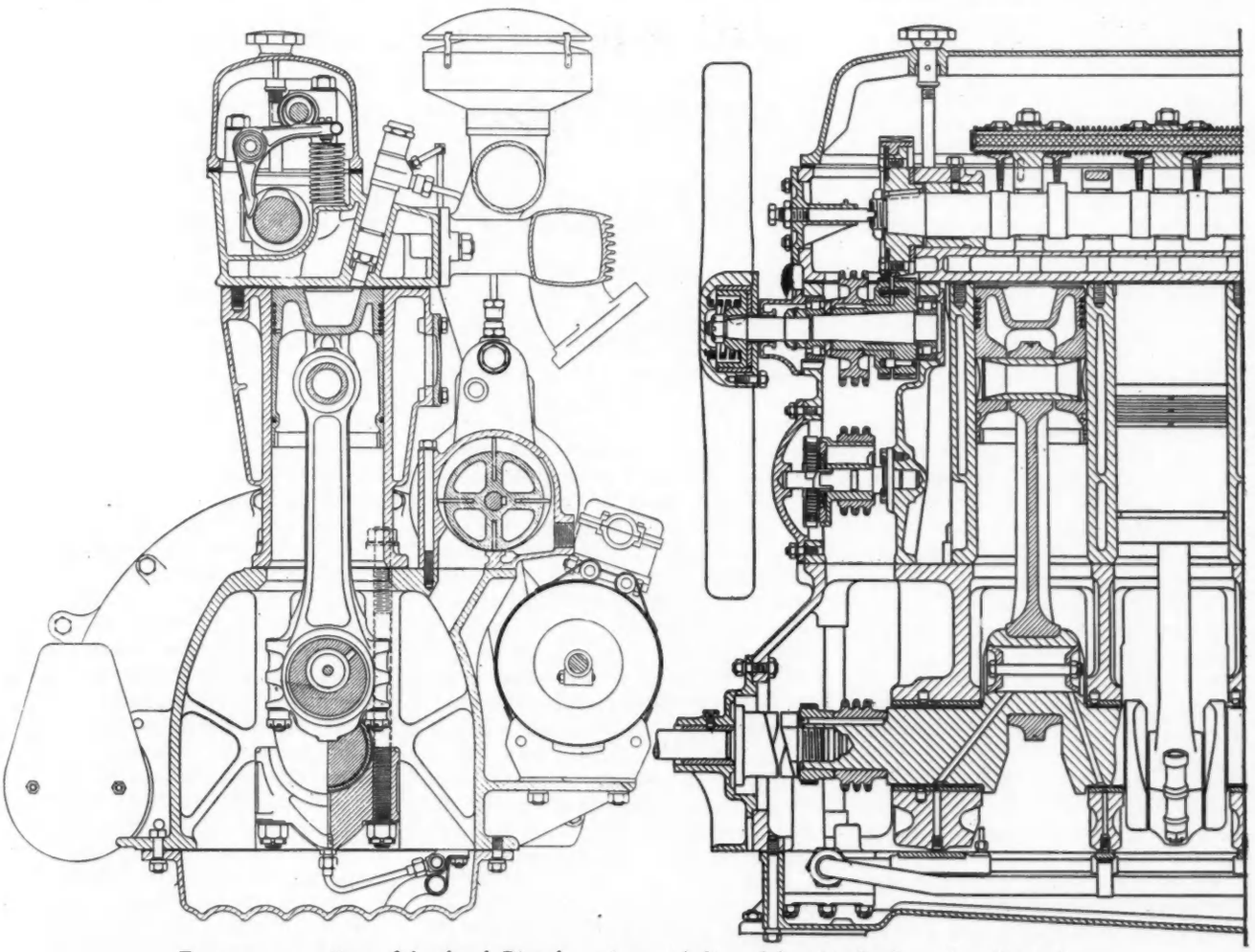
Light Alloys Cut Weight of the New Leyland High-Speed Diesel

Crankcase and sump are magnesium alloy castings. Crank and piston pins bear directly in aluminum rods

SEVERAL new ideas are embodied in the design of a commercial vehicle Diesel engine developed by the British firm of Leyland Motors, Ltd., of which an illustrated description appeared in the June issue of *The Automobile Engineer*. The engine has six cylinders of 4⅜-in. bore and 5½-in. stroke (494 cu. in.), and develops 87 hp. at 1800 r.p.m., the governed speed. With starter, generator, starting crank and decompressing mechanism it weighs 1340 lb., or 15.4 lb. per hp. This low weight is made possible by the extensive use of light alloys.

The compression chamber is in the form of a cup in the piston head concentric with the piston axis. Turbulence is induced in the air entering the cylinder by a deflector on the inlet-valve head. This causes the air to swirl in the cylinder, and the swirling motion is said to be maintained throughout the compression stroke, so that the spray from the nozzle, which enters the cup parallel with and close to the wall, is carried about one-third around the cup before it strikes the bottom thereof.

Pistons are of Y alloy and of the solid skirt type, turned oval and taper. One unusual feature is that while two ring grooves are provided for oil-scraper rings, one of these grooves is left empty when



Transverse section of Leyland Diesel engine at left and longitudinal section through two forward cylinders at the right

the engine is first assembled and it is recommended that a ring be placed in it after about 30,000 miles of service. Connecting rods are of the so-called RR-56 aluminum alloy, and both the piston pin and crankpin bear directly on the aluminum, both being case-hardened. While the rods are of very liberal dimensions they weigh only 3.8 lb. each, complete with cap, bolts and nuts. There has been a good deal of trouble with the babbitt in the big ends of connecting rods of high-speed Diesel engines cracking in service, and this, of course, is obviated by eliminating the babbitt. There is an interesting feature also in the connecting rod bolts which are formed with round heads eccentric to the shanks. The head is sunk in a counterbore on the head of the rod, and being eccentric to the shank, cannot turn when the nut is turned up. Having a round head sunk in the connecting rod head with the head center at a greater distance from the shank than the bolt center, weakening of the rod at this point is reduced to a minimum. The shank of the bolt is undercut, moreover, to prevent concentration of stress at the section where the thread begins.

The crankshaft, which is carried in seven main bearings, has all of its journals and crankpins case-hardened. Main-bearings are of 3-in. diameter. All crankpins are drilled out and the axis of the hole through them is further removed from the crankshaft axis than the crankpin axis, which reduces the centrifugal force on the crank throws more, and the strength of the crank arms less than a similar concentric bore would.

The maximum bearing load on the crankpin is said to reach 2400 lb. per square inch, not counting the fillets as bearing surface.

The crankcase and sump are magnesium-alloy castings, which fact accounts largely for the low specific weight of the engine. For maximum rigidity the crankcase is carried down well below the crankshaft axis and is provided with a wide flange carrying some of the accessories, in addition to the bottom flange. Gas pressure is taken on "through" bolts which extend through the bottom flange on the cast-iron cylinder block, the crankcase partition walls, and the main-bearing caps.

Valves are located in the cylinder head and are actuated by an overhead camshaft which is driven from the crankshaft through a chain and a pair of gears. All of the valve mechanism and the fuel nozzles being on the cylinder head, service work can be done to advantage by removing the head, and in the case of fleets, heads can be interchanged. Valves are actuated from the camshaft through bellcranks, and a decompressor shaft is located above the horizontal arms of the bellcranks, which when rotated through a part of a revolution by means of a control lever on the block, holds the exhaust valves off their seats a distance of 0.040 in. This makes it possible to turn the engine over with ease in priming the fuel pipes and in checking the fuel pump and valve timing, and it can be used also to facilitate starting of the engine in cold weather.

It will be seen from the transverse section of the engine reproduced herewith that the cylinder block widens considerably toward the head, to accommodate a wide head. The valve gear, which is protected by a detachable cover, occupies only about one-half the width of the head, and the injection valves are located outside the cover and therefore readily accessible for service operations.

Both the manifolds are carried by the cylinder head. The inlet manifold is provided with an air cleaner whose filtering element consists of metal shavings wetted with castor oil. An alarm is provided on the line which whistles when the cleaner has become seriously choked. A small breather pipe is provided which draws air from under the valve cover into one of the inlet ports.

Injection pump and nozzles are of Bosch design. The eccentric pump seen in the transverse section of the engine is a vacuum pump used in connection with the vacuum brake booster and has nothing to do with operation of the engine.

The drawings herewith are reproduced from *The Automobile Engineer.*

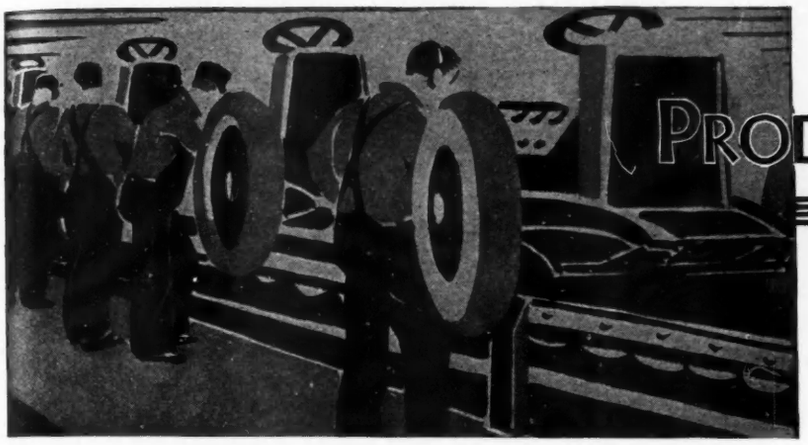
Relation Between Tensile and Torsional Properties of Alloy Steels

IN a recent investigation carried out at Lehigh University and reported in a paper presented at the annual meeting of the American Society for Testing Materials at Chicago by Inge Lyse and H. J. Godfrey, the yield points, ultimate strengths and moduli of elasticity in shear and in tension of ten heat-treated alloy steels (and some structural steels) were determined and compared. The shear properties of such steels are of interest to the automotive engineer because the resistance of the steel to torsion depends upon them. The alloy steels included manganese, nickel, chromium, molybdenum, vanadium and tungsten steels.

The yield point in tension of these steels varied from 37,500 to 53,000 lb. per sq. in. for the steels in the annealed condition, and from 55,000 to 124,000 lb. per sq. in. for those in the quenched condition. The yield point in shear, as determined on solid torsion specimens, varied from 33,500 to 43,750 lb. per sq. in. for the annealed condition and from 44,100 to 93,000 lb. per sq. in. for the quenched condition. In general the ratios between the yield points in shear and in tension were greater for the annealed than for the quenched specimens, ranging from 0.774 to 0.894 for the former and from 0.662 to 0.809 for the latter.

A number of the annealed solid torsion specimens gave ultimate strengths in shear in excess of the corresponding tensile strengths. This is due to the use of the ordinary torsion formula to determine ultimate strength, notwithstanding the fact that the formula does not hold when the stress exceeds the proportional limit of the material being tested.

Poisson's ratio (the ratio of the lateral deformation to the longitudinal deformation of the tensile specimen) varied from 0.272 to 0.320 for the ten alloy steels. With the exception of the tungsten steel there was little difference between Poisson's ratio for the steel in the annealed and in the quenched conditions. After the proportional limit was reached, the relative rate of lateral deformation increased over that of the longitudinal deformation so that Poisson's ratio approached 0.5.



PRODUCTION LINES

Photo-Tube Matches

Apropos of our erstwhile discussion of automatic color analyzers, Westinghouse is out with a simple color matcher which compares a given sample with a standard. A three position color screen permits comparison in each of three bands, blue, green, red. Power supply is from a 110-115 volt, 60 cycle source, no batteries being required. A rectifier tube and filter circuit provide plate and grid voltages for the matching circuit. A sensitivity meter is provided for reading from 0 to 20 with the number 10 appearing in the center of the scale. The optical system is independent of daylight or artificial light. It is made up of four major parts, the lamp, a set of color filters, a lens and mirror, and an integrating chamber. The phototube is the common unit between the optical and electrical systems.

Thermoguard

Full protection against overheating due to many conditions obtaining in the life of heavy duty electric motors used on machine tools, conveyor drives, etc., is promised by a new Westinghouse device. It's the Thermoguard, a built-in, bimetal disk thermostat. The little jigger can be arranged to do one of two things—shut off the source of power, or indicate by ringing a bell or flashing a light. Where and how to use it, why it works, and one or two other things are explained in a little treatise just off the press.

Chrysler, Too

Three Chrysler men are credited with the development of a new mechanical striping gun which is being built by Chrysler for use in its paint shops. The gun is equipped with two interchangeable nozzles giving any desired width of stripe. Paint flows by gravity from two reservoirs so that no air pressure or mechanical aid is needed. Striping is so simplified that women operators now do the job. Hand striping remains as a repair operation.

Tin User

According to "Tin-1933-World Statistics," the automotive industry is one of the most important users of tin. Every vehicle contains upwards of six pounds of tin, those with higher speed engines using even more, it is estimated. Before the depression the automotive industry in this country was using an average of 15,000 long tons of tin per year. "Tin-1933" is published by the Anglo-Oriental Mining Corp., of London, England.

Old Horseshoes

Back in the early fifties, Corliss used old horseshoes for producing highly stressed parts such as long connecting rods. He became convinced that the wrought iron in horseshoes was of a superior grade, due in part to the pounding on the pavements. Old horseshoes were stored in his yards in Providence. These heated to the fusing point in a special furnace were forged into bars for fabrications into con rods and other highly stressed units.

Dry Rectifiers

Copper oxide rectifying units for all kinds of battery charging service are offered by Westinghouse. These Rextox units are all metallic —no wet elements or tubes.

Goats to Cushions

Four million Angora goats with an annual clip of 19,000,000 pounds form the backbone of the mohair industry in this country according to the *Industrial Bulletin* for June. Mohair fiber ranges from 6 to 12 inches in length and has about 30 per cent more strength than wool. In texture, tones and variety of weaves, mohair has a lot on the ball as an upholstery material.

Big Gains

Fully 22 per cent of all foundries in North America produced alloy cast iron in 1932. Only about 2½ per cent did so in 1925. Elements commonly used are nickel, chromium and molybdenum. Vanadium and titanium are used to a limited extent. This and more was told to the Institute of British Foundrymen by F. B. Coyle of The International Nickel Co., recently.

Scopometry—

is the name given to a new method of colorimetric and turbidimetric measurements, the method and instrument being the product of Bausch & Lomb. The instrument is the Exton Junior Scopometer designed for visual measurement of turbidity. The criterion used is the matching of an illuminated line against a field of constant intensity.

Labels Wanted

Understand that p.a.'s here and there are asking for a code of standard colors or something whereby alloy steels may be unmistakably identified in stock. Why not? Citroen, Ford, G.M.C., and others have a code. Their experience should be very valuable in framing a standard for everybody.

—J. G.

MANUFACTURING MANAGEMENT METALLURGY

Zinc Base Alloy Die Castings Fi
Widening Field of Automotive A

by Joseph Geschelin
Engineering Editor, Automotive Industries

EVER widening circle of applications of zinc base alloy die castings—for decorative purposes in automobile construction, in the manufacture of varied accessory items, as well as in other directions is unmistakably pictured in a survey just completed by the writer. Whenever this material is suitable, its use has been justified chiefly on the basis of utility and manufacturing economy.

Here is a typical comment by the chief engineer of a company building high grade automobiles: "The only comment I might make is that five years ago we didn't use a single zinc die casting on our car. Now, on some models, we have as many as 30 pieces. We have been able to use them because of the greater stability of the new alloys. At the present time we are testing a number of new applications such as valve rocker lever housings and ventilating window weatherstrip frame design."

Needless to say, zinc die casting practice has made big strides from the early days when lead and tin were considered "specifics" and were actually put into the alloys instead of being regarded as the worst type of contaminations. Although many failures were experienced with die castings in warm tropical climates and under conditions of high temperature combined with humidity, the advantages from the manufacturing point of view were so outstanding that both users and die casters continued to carry on despite these difficulties.

More recently the development of high purity zinc, of the order of 99.99+ per cent purity, has made available a range of alloys which meets the demands of automotive service. Some idea of variety of applications may be gained from the tables which accompany this article.

Table I, built up form information contained in this survey, should be of more than passing interest to designers in various quarters of the automotve industry. It gives a brief list of some of the common as well as unusual applications which have been grouped under general headings for convenience. Table II is based upon information made available through the courtesy of the Auburn Automobile Co. and gives a list of the zinc alloy die castings used on their line of cars.

In general, all external parts such as lamps, lamp brackets, body hardware, etc., are bright-finished in chromium plate, while those not usually exposed to view, such as carburetors, filters and the accessories mounted on the back of the instrument board, are finished with some suitable protective coating such as cadmium or enamel.

As in other cases of replacement of commonly-used materials and processes due to the availability of new materials, the application of zinc base alloy die castings will be found to depend upon at lease the following considerations:

1. Nature of the specific job.
2. Overall suitability of the alloy under service conditions.
3. Known limitations.
4. Questions of economy, whether or not the volume of production will justify the tool expense.

Undoubtedly there are special cases where the limitations imposed by item four can be ignored. This would apply, for example, where ornamental or utility items are desired in intricate forms which might be difficult to produce by any other method, or where machining costs with any other method might be prohibitive.

To be more specific, engineers indicate that in adopting the die

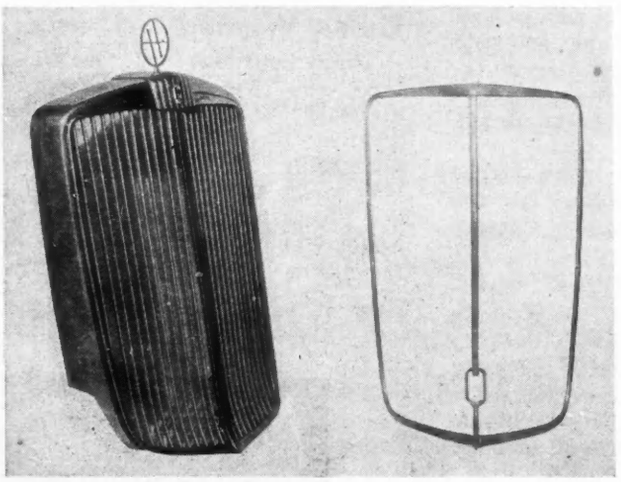


Fig. 1. Hupmobile radiator molding, circular medallion and mounting are of zinc die casting. The grille is fastened to the molding so as to serve both structural as well as ornamental functions

gs Find Steadily ve Application

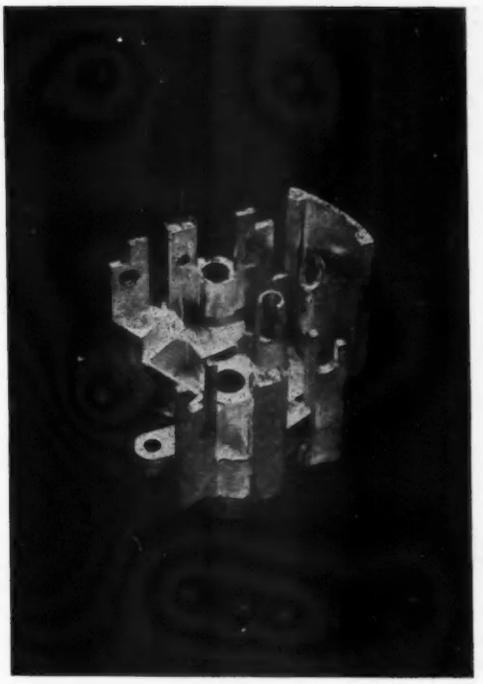


Fig. 2. This speedometer body casting shows how complicated the die casting can be

cast construction they were guided by the following considerations:

1. Manufacturing economies due to a decrease in or elimination of finishing and machining operations, made possible by the accuracy of the finished product.
2. Dies frequently less expensive than the tooling required for fabrication with other materials.
3. Possibility of producing intricate forms, delicate tracings and designs.
4. Simplicity of design, uniformity of the product, practicability of developing thin sections so as to reduce weight.

Behind the scenes we find that the availability of this new technique is due to an extensive program of fundamental research as well as the development of modern die casting equipment and new die casting methods. Out of this activity have been born a number of new zinc-base alloys possessing rather unusual physical properties as well as resistance to aging under normal conditions. A study of the properties of the new alloys which have become available only during the last three years or so probably will answer some of the questions that may be uppermost in the minds of those responsible for the successful operation of their products.

Table III shows the effect of normal aging upon certain critical physical properties of zinc alloys. Perhaps the best index is that of impact strength which appears to be only slightly affected in the case of Zamak 3, 5 and 6, after indoor aging for two years. It is interesting to note that the original physical properties were determined six months after casting date.

Table IV is a comparison of the physical properties of certain zinc base alloys with those of other case materials. This comparison is if value to the engineer when considering whether or not a substitution of materials may be safely recommended.

Since a majority of the applications are external where eye appeal, durability of the bright coating, and freedom from corrosion are essential, the question of successful bright plating is of great concern to the designer as well as the production department. This problem has been vigorously attacked and, it is claimed, that a comparatively foolproof solution has been found. A rather comprehensive treatment of chromium plating on zinc alloys was published in *Automotive Industries*[1] last year. Quoting the authors, "Nickel chromium coatings of satis-

Table I Some Uses of Zinc Base Alloy Casting

Body Hardware
- Concealed Door Hinge ("Common-Sense")
- Door Handles, inside and outside
- Regulator Handles

Body Trim and Parts
- Instrument Panels
- Windshield Frame
- Center Disk for Coach Side Arms (G & O Mfg.)
- Window Weatherstrip Frames
- Robe Rail Brackets

General Hardware
- Radiator Cap
- Gasoline Tank Covers
- Radiator Hood Yokes
- Tire Locks
- Ornaments
- Hood Hinge Brackets

Lamps and Lamp Mounting
- Tail Lamp Brackets
- Fender Lamp Body
- Tail Lamp Body
- Headlamp Bracket

Accessories
- Carburetor Body
- Carburetor Parts
- Fuel Pump
- Speedometer head, adapter, etc.
- Tachometer Frame
- Horn Projector
- Gasoline Filter
- Float Bowl Cover
- Magneto Frames, Cover Plates, etc.
- Magneto Mounting Brackets
- Distributor Governor Lever
- Flywheel Magneto Governor Levers
- Magneto Rear Plates
- Governor Weights
- Ignition Lock
- Throttle Pump (on carburetor) Body
- Windshield Wiper Body

Engine Parts
- Engine Bearing Oil Retainer
- Engine Filler Blocks
- Valve Rocker Lever Housings
- Ignition Distributor Bracket

Miscellaneous
- Brake Shoes
- Generator Drive Pulley
- Fire Extinguisher Pump
- Roller Bearing Cages
- Tie Rod Brackets (Radiator)
- Hub Caps
- Radio Mounting Bracket
- Radio Adj. Pulley
- Hood Door Windsplit

[1] "Chromium Plating on Zinc Alloys Should Have 0.0003 in. Thickness," by E. A. Anderson and C. E. Reinhard, Automotive Industries, April 2, 1932.

Table 2 Zinc Die Cast Parts Used in Auburn Cars

Oil Pump Cover
Stationary Clutch, Support Hub in Dual Ratio Axle
Vacuum Cylinder for Dual Ratio Axles
Vacuum Cylinder Base for Dual Ratio Axles
Dual Ratio Control Lever
Dual Ratio Control Shut-Off Valve
Dual Ratio Operating Valve
Radiator Molding Assembly
Carburetor Assembly
Fuel Pump Assembly
Electrolock Assembly
Cowl Lamp Brackets
Tire Carrier Lock Barrel
Speedometer Adapter
Speedometer Head
Outside and Inside Door Handles, Regulator Handle and Robe Rail Brackets
Instrument Board Compartment Door
Ash Receiver Lid
Convertible Windshield Assembly
Convertible Top Hold-down Bracket
Convertible Top Hinge Brackets

factory durability can readily be plated on zinc and its alloys, and coatings of this sort are obtainable today. On the other hand it must be admitted that coatings of inferior quality are prevalent. This situation is not true of zinc alone, but may be noted with all of the other plated metals.

"The writers are of the opinion that the responsibility for these inferior coatings devolves upon the purchasers. Coatings of lasting quality can be obtained if, and when, the purchaser sets up and enforces a reasonable specification and allows the plater a price at which he can afford to follow the specification."

The authors recommend a protective nickel-coating, 0.0003 in. or greater in thickness of nickel for satisfactory automotive service. Coatings even a little thinner than this will fail within a short time.

The AC Spark Plug Co. has been one of the most active organizations in the automotive industry in developing die cast automotive products of every description in their die cast division. A comprehensive treatment of design for die casting, die casting practice, characteristics of materials which may be used, etc., was first made available in text form by Marc Stern of that company in a book, "Die Casting Practice," published by McGraw-Hill (1930).

It may be of interest in this discussion to mention some of the unusual applications as well as those which seem to be peculiarly suited

Table 3 The Effect of Two Years of Normal Aging on the Properties of Die Cast Zamak* Alloys

Die castings are submitted to various accelerated aging tests but none has ever been successfully correlated to normal aging. Consequently normal aging figures are the only reliable basis for forecasting service expectancy.

	INDOOR AGING	
	Original[1]	Two Years
Zamak 2 4% Al.—3% Cu.—.03% Mg. Balance Horse Head Special Zinc		
Tensile Strength—Lbs./Sq. In.	47,300	48,500
Impact Strength—Ft. Lbs.	15.00	9.25
Brinell Hardness	83	100
Per Cent Elongation in 2 In.	8.4	6.6
Expansion of 6" Bars in Inches[2]		—.0006
Zamak 3 4% Al.—.04% Mg. Balance Horse Head Special Zinc		
Tensile Strength—Lbs./Sq. In.	36,700	34,300
Impact Strength—Ft. Lbs.	19.50	18.75
Brinell Hardness	63	68
Per Cent Elongation in 2 In.	5.3	6.9
Expansion of 6" Bars in Inches[2]		—.0004
Zamak 5 4% Al.—1% Cu.—.03% Mg. Balance Horse Head Special Zinc		
Tensile Strength—Lbs./Sq. In.	41,600	39,100
Impact Strength—Ft. Lbs.	17.75	17.75
Brinnell Hardness	73	76
Per Cent Elongation in 2 In.	4.2	4.4
Expansion of 6" Bars in Inches[2]		—.0005
Zamak 6 4% Al.—1.25% Cu. Balance Horse Head Special Zinc		
Tensile Strength—Lbs./Sq. In.	39,600	38,500
Impact Strength—Ft. Lbs.	18.50	18.50
Brinell Hardness	71	78
Per Cent Elongation in 2 In.	10.6	9.8
Expansion of 6" Bars in Inches[2]		—.0004

[1] Original Properties were determined 6 months after casting date.
[2] Expansions were determined by using the lengths of the impact bars, after 6 months' normal aging, as the original measurements.
* Zamak is a registered trade mark applied to die casting alloys manufactured by The New Jersey Zinc Company from HORSE HEAD SPECIAL (99.99 + %) ZINC. The formulas for these alloys are covered by patents own by The New Jersey Zinc Company. Licenses to make these alloys with HORSE HEAD SPECIAL (99.99 + %) ZINC under these patents have been granted to a number of manufacturers of alloys and certain commercial die casters who make their own alloys.

Table 4 Comparative Strength of Cast Materials

IMPACT STRENGTH	Ft. Lbs. to Break ¼" □ Bar
Sand Cast Malleable Iron	8—12
Sand Cast Brass	>20
Cast Iron	0— 2
Die Cast Aluminum Alloys	2— 5
Die Cast ZINC Alloys made of Horse Head Special Zinc.	15—20

TENSILE STRENGTH AND ELONGATION	Tensile Strength # / □ "	Elongation % in 2"
Sand Cast Malleable Iron	50,000—56,000	12—22
Sand Cast Brass	25,000—35,000	10—28
Cast Iron	20,000—30,000	—
Die Cast Aluminum Alloys	25,000—35,000	1— 5
Die Cast ZINC Alloys made of Horse Head Special Zinc.	35,000—55,000	4—10

to the die casting technique. The first of these is the A-B-F "Common-Sense" concealed hinge which was described in *Automotive Industries* recently. The two leaves which carry the brunt of the load are made of Zamak No. 2 zinc base alloy which is said to be free of porosity and possessing a tensile strength of 47,300 lb. per sq. in. by virtue of a new high pressure casting process. Another very recent application is that of producing horn projectors of intricate form. One of the manufacturers of this type of accessory tells us that the advantage of die casting is that it eliminates large die charges for special shapes. At the start these die castings presented some problems in plating but they have succeeded in developing a procedure which produces a good chromium finish. Incidentally the projectors are said to produce excellent tone qualities.

In a number of cases the die casting has replaced certain well-entrenched stampings such as lamp bodies, radiator filler caps, gas tank filler caps, and in the case of one prominent car maker, the generator driving pulley. It is claimed that within the limits of the quantities produced, die casting has reduced the final cost of the product.

Several prominent engine builders are using die cast oil retainers in place of the original cast iron part which was rather difficult to machine. Another typical application, interesting although not new, is that of die-cast governor weights. Where quantity warrants, this construction has many advantages the most important being the fact that the die cast parts are uniform as to dimensions and balance without machining of any kind; also because the governor element may be made more compact inasmuch as a zinc alloy of great density may be used.

Zinc base alloy die castings have not been used to any appreciable extent in aircraft and aircraft accessories because of the need for utilizing light weight but necessarily strong materials. Nevertheless there seems to be a field for zinc in certain places and the limitations of weight may be met by the use of the new alloys which may be cast in thin, accurate sections possessing reasonable strength.

For an entirely different reason, the influence of die cast parts has not been felt to any great extent in the design of industrial equipment, tractors, etc. The chief limitation lies in the relatively small production quantities involved which, apparently, do not justify the investment in die equipment. The logical approach in this direction is indicated by the fact that certan fittings and accessores which are practically interchangeable on may different makes do utilize die casting construction. Examples are magnetos, magneto mounting brackets, carburetors, etc. It may be possible to extend there uses still further in the design of other standard and more or less interchangeable parts.

Because of the widening degree of usefulness of zinc alloy die castings, an intensive research program is under way in many quarters. Its objective is the development not only of new alloys and methods, but also the establishment of reasonable limitations to the use of these alloys. Briefly, this program is being carried on along the following lines:

1. Development of new alloys and manufacturing technique.
2. Study of physical properties of these materials.
3. Effects of aging.
4. Effects of elevated temperature.
5. Effects of atmospheric conditions.

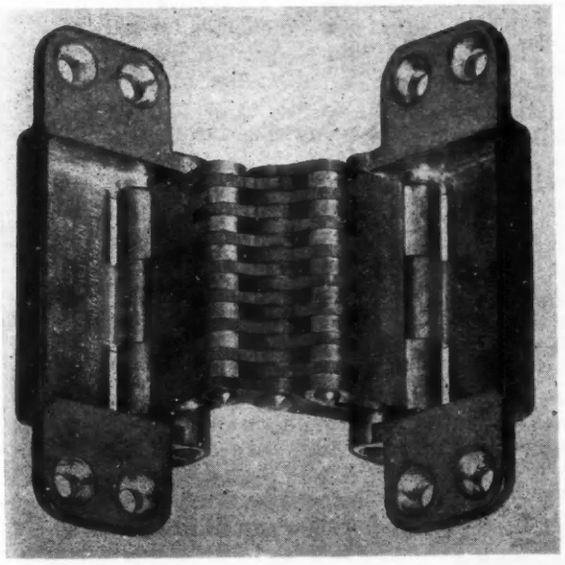


Fig. 3. "Common-Sense" concealed hinge with attaching leaves or "butts" of zinc die castings.

Is the Open Shop in Jeopardy?

The Will to Cooperate With Government and of Government to Cooperate With Both Industry and Labor Should Avert a Serious Outbreak of the Age-Old Struggle

by L. W. Moffett
Washington Representative, Automotive Industries

WITH industry trying desperately to emerge from the depression, there is evident a real will to cooperate with government in setting up its "government - business partnership." And this may mean that the struggle between organized labor and the open shop will not be as bitter as it might otherwise be. A factor favoring constructive action is the eagerness of the administration, industry and the millions of sufferers from unemployment to reestablish earning power and profits.

There have been some flare-ups which for a time have made it seem that organized labor and the open shop had come to grips in a serious and destructive struggle. There have been and are some who hold that this old conflict is the key log in the jam blocking the efforts of the National Recovery Administration.

The differences between organized labor and the open shop obviously began to take on pointed form as soon as the National Recovery Act was passed—or when it was under consideration in Congress. While business to a surprising extent urged the law, especially because it granted certain exemptions from the anti-trust laws for industries upon approval of codes of fair competition, there always was a dubious feeling toward labor provisions of the act. It was felt and the feeling grew that they gave to labor more than they gave to industry.

Nothing more pleasing to organized labor has got the O. K. of a Congress and a President than the National Recovery Law. More than once industry in the past has been told that, as sound as its arguments were for loosening of the anti-trust laws, if they were liberalized industry would get less out of it than organized labor. At no time has organized labor ever offered opposition to loosening of the anti-trust laws. On the contrary it has frequently either openly or quietly urged such legislation.

Organized labor suffered greatly from the depression. Its ranks were depleted rapidly. Alarm prevailed among A. F. of L. officials. Then along came the proposed Black 30-hr. bill. It died in committee but its fundamentals were carried into the National Recovery Act. Shorter hours, higher pay, and the reassertion of the right of collective bargaining by employees through representatives of their own choosing. A better pattern to fit into organized labor's program or a more opportune time to build up the roads can hardly be imagined.

That this has been and is being done intensively by organized labor throughout all industries of the land is well known.

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"THE employer is as free to make non-membership in a union a condition of employment as the working man is free to join the union. This is part of the constitutional rights of personal liberty and private property **NOT TO BE TAKEN AWAY EVEN BY LEGISLATION.** . . . The same liberty which enables men to form unions, and through the unions to enter into agreement with employers willing to agree, enables other men to remain independent of the union and other employers to agree with them to employ no man who owes allegiance or obligation to the union."

From decision of the U. S. Supreme Court, Dec. 10, 1917, in the Hitchman Coal & Coke Case.

Open shop industries, such as motor vehicles, steel, and others became increasingly apprehensive. Efforts to combat the movement by setting up more company unions have been made. Considerable success has been met in this drive, but perhaps not of the proportions of the success experienced by organized labor. In coal alone, the United Mine Workers Union claims to have added 300,000 employees to its ranks. Even discounting this figure by one-half the total is considerable.

The labor organization question has clearly been a primary cause for the delay of major industries in filing codes. So outstanding has this issue become that General Johnson, going much further than his previous statement that he would not permit the National Recovery Act to be used as a vehicle for unionizing industry, came out flatly last Friday night and recognized the strife between the open shop and the closed shop. He berated both. He said in effect the act is not a charter for either.

Said General Johnson:

"Circulars and other literature purporting to come from labor union agents have intimated or openly stated that it is a purpose of the National Recovery Act and Administration to unionize labor or that the only way labor can secure benefits under that Act is to join this or that union.

"Similar statements purporting to come from industrial concerns have intimated that this or that newly formed company union is the only organization through which labor can get a fair deal under this Act.

"Both statements are incorrect and such erroneous statements of the Act and its Administration

tend to foment misunderstanding and discord.

"It is the duty of this Administration to see that all labor—organized as well as unorganized—gets a square deal, and the Administration is organized to do and will do that duty. The improved labor conditions proposed in the textile industry, which is largely unorganized, are an example of this. It is not the duty of the Administration to act as an agent to unionize labor in any industry and, as has repeatedly been stated, it will not so act. It is the duty of this Administration to require the inclusion in codes of the mandatory conditions of Section 7 and to see that these conditions are complied with, and it will perform that duty.

"The policy of the National Recovery Administration respecting the rights and obligations of both organized and unorganized labor is based on the declaration of policy in Sec. 1 of the Act itself, which clearly stated the objectives of this legislation, in part, as follows:

> "'to induce and maintain united action of labor and management under adequate government sanction and supervision.'

"Manifestly the purpose of the Act is to create and preserve harmonious relationships and to prevent industrial strife and class conflicts.

"Labor in any industry has the right to organize and bargain collectively; the law also recognizes the right of individual workers to bargain for their own conditions of employment. But in the execution of this new social policy to which the government stands committed, it is the obligation of the National Recovery Administration to require the payment of living wages by industry as a condition of continued existence and to prevent excessive and unreasonable disparities, in the interest both of social justice and a balanced economy.

"Collective bargaining under adequate Government sanction and supervision should hold no fears for the fair-minded industrialist; on the other hand, the National Recovery Administration pledges itself through its Labor Advisory Board to obtain a fair deal for labor in any industry presenting a code, whether the employees are organized or not. It is not the function or the purpose of the Administrator to organize either industry or labor."

But efforts to allay the fear of industries that they will be unionized have not proven successful. The fear remains.

There is no open criticism of a particularly bitter character of organized labor for its part in blocking the filing of codes—for many industries insist this is what organized labor is doing—but there is a great deal of under-surface criticism. It is only a statement of fact, however, to say that the greater criticism is directed toward industry itself. The contention is made that it is over-emphasizing the dangers of unionization.

There are industries with the open shop which apparently have their policy well established with no apparent chance of organized labor breaking into it. Their employees do not want the disturbance they feel organized labor would bring to them. They are satisfied with working conditions as they exist which often are better than those in closed shops.

Where these conditions prevail and the company unions operate, industries are safe from organized labor. It is a mistaken belief that organized labor has anything whatsoever to do with such an organization. No matter if a given industry is almost entirely organized by labor union officials, if a single plant in that industry is operated through company unions it can go along under that system. Codes are based upon trade associations "truly representative" of the industries for which they speak. Labor in any plant, in effect, is built upon labor which is "truly representative" of that plant. If it is company union labor, then company union labor controls, not organized labor, no matter how much control organized labor may have in some related plant.

Operators of company union plants are not only concerned over attempted unionization but have been concerned over the attitude taken toward company unions by Miss Frances Perkins, Secretary of Labor. Miss Perkins has commented pointedly on newly formed company unions. She contends they have been organized to evade the National Recovery Act. Consequently she has compared industries forming company unions with the war bridegrooms who married in order to escape the draft.

General Johnson declares that the act is meant no more for labor than it is for industry. His view manifestly is broader than that of the Secretary of Labor, but the sentiment of the latter, many industrialists claim, is the more prevalent.

There is hope that the key log in the jam can be removed without a serious splash. The hope is that either the President himself or General Johnson will be able to remove it without trouble. General Johnson is keenly anxious to get the stream of business and labor moving swiftly and safely. Unless it does so soon he has said very outspokenly that the country is headed for a terrific smash.

THAT the administration wants quick action on codes covering hours and wages, and that it hopes not to use "The Big Stick" to get it, was made abundantly evident this week. Its insistence is based on concern over the expansion in production which it apparently does not think has been accompanied by a proportionate increase in purchasing power. It feels that unless the recovery program becomes immediately operative in stimulating purchasing power, dire results are certain.

In the accompanying article, the Washington representative of Automotive Industries, who has been in close touch with the Recovery program since its inception, describes the situation as he sees it. The key log in the jam, he finds, is the labor organization question. Whether fears on this score are justified in view of General Johnson's statement that "It is not the function or the purpose of the Administrator to organize either industry or labor," these fears do exist and they constitute a major factor in the situation on which the administration has commented so forcefully.

Tire Fabric Mills Get Three-Week Exemption

President Roosevelt Also Puts Office Workers Under Cotton Textile Code Rules

WASHINGTON — Manufacturers of tire yarns or fabrics for rubber tires were exempted for a period of three weeks from the limitation on the use of productive machinery to a maximum of 80 hrs. per week by President Roosevelt's approval of the Cotton Textile Code. The exemption expires July 30.

It will be recalled that at the hearings the "Big Four" tire manufacturers operating their own cotton mills asked permission to run 144 hrs. weekly, stating that full time operation was necessary to keep their tire factories supplied. Other tire makers not operating their own cotton mills took the position that limitations should be uniform as otherwise their suppliers' costs would be increased to their disadvantage. The three-week exemption for all tire fabric mills is the answer to these contentions.

The President's approval of the code also brought office workers under the minimum wage-maximum hour limits and added the requirement that maintenance crews, etc., excepted from the maximum hours limit by the code, be paid time and a half for hours in excess of the 40-hr. weekly limit established by the code.

Auburn Prices Lower On Salon Series Cars

Prices of the Auburn salon series, both eight and twelve cylinder models have been reduced. On the eights, the reduction amounts to $150, while the reduction on the twelves is $100. Prices of individual models are as follows:

Body type	Eight	Twelve
Brougham	$1045	$1595
Sedan	1095	1645
Cabriolet	1145	1695
Phaeton	1195	1745
Speedster	1195	1745

N.A.C.C. Output in June Doubles Last Year's Total

NEW YORK—June production of cars and trucks by members of the National Automobile Chamber of Commerce is estimated at 195,178, a gain of 104 per cent for the group over last year, and of 13.2 per cent over May, 1933. For the first six months of the year N.A.C.C. production is placed at 800,290, as compared with 680,218 in the same period last year, representing an increase of 18 per cent.

The N.A.C.C. estimate does not include Ford, which is estimated for June at more than 50,000. Thus present indications are that the industry total in June was between 245,000 and 250,000, the largest output for any month in two years. For the first six months, on this basis, total output for the industry will approximate 1,030,000, as compared with 911,000 in the corresponding months of 1932.

S. E. A. Meeting Considers Code

Nine Groups Select Committees To Recommend Rates and Hours To Meet National Recovery Act

DETROIT—Manufacturers of automotive service equipment expect to adopt a code embodying the maximum hourly and minimum wage rates developed by the metal trades, according to W. C. Allen of the Brunner Mfg. Co., chairman of Service Equipment Associates. Service Equipment Associates sponsored a three-day meeting of about 100 of the leading equipment manufacturers at the Hotel Statler in Cleveland this week at which considerable progress was made in refining a fair competition code developed at an earlier meeting of the group in Chicago.

Each of the nine groups selected a committee to make recommendations for meeting the wage and hour requirements of the National Industrial Recovery Act and these committees at a joint meeting Wednesday decided to write into the shop equipment code provisions to be developed by the metal trades.

The shop equipment code will be filed through the M. E. M. A. as part of an automotive parts, accessories and equipment code now being developed by the M. E. M. A. Rules in the fair trade code as acted upon by the nine groups will be correlated and then sent to every known manufacturer in the shop equipment industry for final action.

The following classes of equipment were represented at the general group sessions: Air compressors, lifts, car washers, jacks, brake and wheel aligning, heavy equipment, motor reconditioning equipment, greasing and electrical service.

Most of the rules in the tentative Service Equipment Associates' code were approved by all groups.

Further attention will have to be given to rules covering classification of customers, warehousing, consignment, etc.

NEW

Chevrolet Has Three New Plans for Paying Salesmen

DETROIT—Chevrolet is presenting three new plans for compensating retail salesmen to its dealer organization. All three proposals are reported to be directed at raising the total compensation to salesmen to 6 per cent of combined used car volume and new car sales at list prices. It is also understood that the company is desirous of having dealer credit a commission on house sales to the salesmen's account; in fact at least two of the plans provide for this directly. Two of the plans provide also for creating a salesmen's reserve which is disbursed in equal payments in November, December and January.

Roosevelt Considering Blanket Order On Hours and Wages

WASHINGTON — While not displeased with the progress being made toward perfecting codes, President Roosevelt believes that if industries will agree to increase wages and reduce working hours under a general plan, employment and purchasing power will be greatly and quickly increased.

In order to expedite matters along these lines he has under consideration a blanket order to be issued under the National Industrial Recovery Act to establish minimum wages and maximum hours until agreements have been reached by the many industries upon codes of fair competition. This subject was brought up by General Hugh S. Johnson at the first meeting of the new executive council held July 12.

While it is believed that such steps could be made mandatory under the law, the President is hopeful that some of the major industries will voluntarily offer to act under such an order until their codes can be completed and approved.

EWS

July Production Schedules Likely To Be Boosted as Sales Hold Good

An Output of 200,000 May Be Reached for Third Consecutive Month. New Car Stocks Continue at Satisfactory Low Point

By Athel F. Denham
Field Editor, Automotive Industries

The upward revision of tentative production schedules about the middle of the month is a distinct possibility repeating, if it materializes, the history of the past few months. Scattered reports from dealers on retail deliveries for the first week or ten days of July indicate that while the holiday week-end has reduced sales to some extent, the reduction was considerably less than had been anticipated. On the whole, retail sales at the present time are not far below the figures for the same time last month with a good chance that production for the industry to supply dealers' orders may exceed the 200,000 mark for the third consecutive month including passenger cars and trucks for the United States and Canada.

Stocks of new cars continue to be

(Turn to page 82, please)

Highway Freight Assn. to Represent Truckers

Will Be Reorganized to Make It Representative of For-Hire Operators

CHICAGO—A compromise agreement between the American Highway Freight Association and the Truck Executives Association of America was reached after a heated day-long session in the Palmer House here on July 11.

The two organizations, representative of an important share of the motor freight industry of the nation, agreed to reorganize the American Highway Freight Association to make it representative of the for-hire motor freight industry in the drafting of a code of fair practices under the National Industrial Recovery Act.

A committee put the sentiment of the associations in the form of a resolution after efforts to agree had failed on the floor. At a late hour accord was finally reached. The committee included Walter Beck, Texas; E. J. Buhner, Indiana; Frank B. Caughlan, Missouri; C. E. Cotterill, New York; H. C. Mims, South Carolina; C. S. Reynolds, Washington; Frank C. Schmidt, Ohio, and C. O. Sherrill, of Ohio, was chairman.

Present officers of the Highway Freight Association will continue in office, but each state will hold an election between September 1 and September 15 to choose a new director who must be a for-hire operator. Meanwhile, work on the code for submission to the directorate will go forward.

Committee Studies Data For N.A.C.C. Code

DETROIT—Tuesday's all-day session of the N. A. C. C. Industrial Code subcommittee headed by Donaldson Brown of General Motors Corp., was devoted to study of statistics made available to the committee up to that date. The committee arrived at no conclusion and adjourned until next week when further data on employment conditions, etc., will be studied. Apparently it will be at least two weeks and probably more before the committee is ready to make a report to the N. A. C. C. directors.

Polk Estimates June Sales 4% Above May

Indicated Increase Much Below Expectations Based on Factory Sales Reports

DETROIT—June car sales apparently exceeded May only by approximately 4 per cent, R. L. Polk & Co. estimates on the basis of reports for the first 26 days of the month from 26 cities geographically scattered across the country. This would make the total for the month about 165,000 which is substantially below the total forecast by retail sales reports issued by leading manufacturers and suggests a lag in registration reports.

The first ten states and the District of Columbia to report on June registrations of passenger cars show a gain of 3 per cent over last year. However, these returns are not regarded as indicative of the country as a whole for the reason that in May these states showed a gain of only 12.5 per cent over 1932 whereas the national gain in registrations was actually 22 per cent. If these states get the same proportion of June national sales that they obtained in May, a total for June registrations of new passenger cars of 170,000 is indicated. This total also is substantially below estimates based on factory sales reports.

In the states which have reported to date, Chevrolet is 22 per cent ahead of last year, Plymouth has a gain of 62 per cent while Ford is 45 per cent behind June, 1932.

Tire Prices Must Increase, Says General's President

AKRON, OHIO—"Tire prices will have to be increased as the direct result of President Roosevelt's signing the cotton textile code," said William O'Neil, president of the General Tire & Rubber Company. "How much or how soon will be up to the industry.

"We are thoroughly in accord with the provisions of the bill fixing a minimum wage for textile mill labor, but we had hoped that the provision of the act, making 80 hours a week the maximum number of hours that textile mill machines might be operated, would not be made effective until Oct. 1. If that were done, I do not believe there would be a tire fabric shortage, as there is a slowing down in demand ordinarily, after Oct. 1.

"As signed, the law now provides that, after July 30, machines in textile plants may not be operated more than 80 hours a week, instead of 144 hours as at present. We think there should be no restriction on the operation of machines until at least Sept. 1, as cotton milled during August is used in the tire factories in September."

Wholesalers June Business Nearly Equals 1932

DETROIT—With fifty automotive wholesalers reporting to the National Standard Parts Association, business done in June was shown to be only two per cent less than that in the corresponding month of last year. The members reported that the percentage of collections against accounts receivable was 48. For the entire year of 1932, N. S. P. A. wholesalers reported this figure as 56 per cent, in 1931 as 59 per cent and in 1930 as 66 per cent. The reports indicate that collections are improving steadily.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

General business activity continues to increase rapidly, along with rising commodity and security prices and further depreciation of the dollar in foreign-exchange markets. The price advance and the dollar depreciation were accelerated last week by the message of President Roosevelt to the World Economic Conference and the intimation that the goal of the Federal Administration was the restoration of the general price level to something approximating the 1924-25 average.

Car Loadings Continue Up

The advance in trade and industry is illustrated by the continued increase in the volume of railway freight. Loadings during the week ended July 1 totaled 634,074 cars, showing an increase of 29,406 cars above the figure for the preceding week and a gain of 145,793 cars above that for the corresponding period last year. Estimates by the Shippers' Regional Advisory Boards indicate that loadings in the third quarter of this year will be about 10 per cent larger than those in the similar period of 1932.

Power Production Increasing

Another indication of expanding business is the continued gain in production of electricity. Output of the electric light and power industry for the week ended July 1 exceeded the total of a year ago by 13.7 per cent, showing the ninth successive weekly increase over the corresponding figures for 1932.

Crude Prices Advancing

Average daily crude petroleum production for the week ended July 1 amounted to 2,602,050 barrels, as against 2,513,600 barrels for the preceding week and 2,104,800 barrels during the corresponding period last year. Prices of crude oil were advanced last week by several purchasing companies in the Eastern and Mid-Continent fields.

Coal Production Brisk

Bituminous coal production in June, according to the preliminary estimate, increased moderately, totaling 24,870,000 tons, as compared with 22,488,000 tons in May and 17,749,000 tons in June, 1932. Anthracite production showed a sharper gain, amounting to 3,905,000 tons, as against 2,967,000 tons in the preceding month and 2,550,000 tons a year ago.

Fisher's Index Shows New High

Professor Fisher's index of wholesale commodity prices for the week ended July 8 stands at 66.6, which compares with 65.1 a week before, 64 two weeks before, 63.5 three weeks before, and 62.7 four weeks before. The current figure is the highest for the year to date and is also higher than any level reached in 1932.

Federal Reserve Statement

Discounts of the Federal Reserve banks decreased $9,000,000 during the week ended July 5, while open-market purchases increased $15,000,000 and holdings of Government securities $20,000,000, making a net gain of $25,000,000 in bills and securities held. Circulation of Federal Reserve notes rose $54,000,000 and of Federal Reserve bank notes $4,000,000, while deposits decreased $59,000,000 and reserves $29,000,000. The reserve ratio declined from 68.8 to 68.4 per cent.

Tires to Be Standardized At London Conference

LONDON (*By mail*)—An international conference is to be held in London this month at which the establishments of universal standards for rims, tires and tire valves is to be discussed. The conference is being organized by the Standards Committee of the Institution of Automobile Engineers acting as secretariat of a technical committee of the International Standards Association. The American and British tire industries and a substantial part of the Continental interests concerned are taking an active part in the conference, and the hope has been expressed that the event will afford an opportunity for close contact among tire technicians of various countries, permitting of an exchange of views on problems of interest to the automobile industry as whole.

Studebaker Has Best Month in Three Years

SOUTH BEND—Studebaker wound up the first six months of 1933 with the highest volume of June business since 1930, according to an announcement made here today by Paul G. Hoffman, president of The Studebaker Sales Corp. of America.

"Sales of Studebaker and Rockne passenger and commercial cars during June of this year reached a total of 5050 units," Mr. Hoffman said. "This was 8.5 per cent ahead of June, 1931, when 4656 cars were sold and 5.9 per cent over June, 1932, when 4770 sales were made. A total of 7548 orders for Studebaker and Rockne cars were recorded for June, the largest number for any June since booming 1929."

AC Beats 1929 in June

FLINT, MICH.—AC Spark Plug Co. has reported a substantial increase in employment, unfilled orders, production and sales during the month of June. Production even exceeded the peak month of June, 1929. June sales in dollars increased 104 per cent over June a year ago and 20 per cent over May this year.

Employees at the end of June numbered 3124 as compared with 2386 working part time in June a year ago, and against 2824 in May this year. This represents an increase of employees of 300 in June and more than 1000 since April 1, 1933.

Payrolls for June increased 130 per cent in dollars over June a year ago and 15 per cent over May this year.

Continuance of operations at high levels during July is indicated, according to Harlow H. Curtice, president and general manager.

Olds Resumes After Holiday Shut-Down

LANSING—Operations were resumed at the Oldsmobile and Fisher Body plants here Monday morning with production schedules for July increased over those of June by 25 per cent. The plants were closed last week due to the holiday on Tuesday. Orders on hand indicate no let-up in dealer demand. June was the best month for Olds since May, 1931, and already more cars have been produced than during the entire 12 months of 1932.

Black & Decker Gains on 1932

BALTIMORE—S. Duncan Black, president of the Black & Decker Manufacturing Company, Towson Heights, Md., manufacturer of electric tools, says that both production and employment at the plant has increased over this period of last year.

G.M. of Canada Has June Gain of 123%

TORONTO—According to H. A. Brown, vice-president and general manager of General Motors of Canada, Ltd., June shipments were 123 per cent greater than for the corresponding month of 1932. The increase only in the scheduled production for the month just closed was 2049 car units, while the "step-up" in the factory schedule for May and June combined was 4898 cars. It is officially stated that shipments from the Canadian plant of General Motors have been double what they were for the same period last year.

Chevrolet June Output Biggest in Two Years

DETROIT — Production of new Chevrolet cars and trucks in June more than doubled output for the corresponding month last year and was the largest single month's production in two years. With a total output of 81,573 units, June compares with 36,142 in June last year and with 68,538 in May this year, previously the best month since June, 1931.

Graham Shipments Gain 18% in Second Quarter

DETROIT—Shipments of Graham cars in the second quarter were more than 18 per cent greater than in the same period of 1932, according to Robert C. Graham, vice-president of Graham-Paige Motors Corp. Total shipments were 3560 cars as compared with 3004 cars in the second quarter of 1932. For the sixth consecutive month export shipments exceeded those for 1932.

Eaton Payroll Expands

CLEVELAND—Factory payrolls of the Eaton Mfg. Co., Cleveland, in June showed an expansion of nearly 200 per cent over March, and of 35 per cent over June, 1932, according to company officials. The company's payroll index, with the 12-month average for 1932 as 100, stood at 150 in June, against 131 in May, and at the highest point since the spring of 1931. Approximately 3000 employees are on the payrolls at the present time.

DeSoto Hits New High

DETROIT—Breaking all records for the eighth consecutive week, sales of DeSoto and Plymouth cars by DeSoto dealers reached an all-time high during the week ending July 1, according to Byron Foy, DeSoto president. Retail sales of DeSoto cars for the week ending July 1 totaled 555 units, an increase of 18.1 per cent over the previous week. This was the best week for DeSoto retail sales since June 25 of last year. Mr. Foy also stated that 75 per cent of DeSoto's projected July output is already sold in advance to dealers. More than 3200 unfilled orders for new DeSoto cars were on hand yesterday.

Hudson Has Big June in Canada

TORONTO—Sales in Canada of Hudson and Essex Terraplanes for the month of June were 500 per cent greater than the figures for the same month of last year, according to Ross MacKinnon, the new general sales manager of Hudson-Essex of Canadia, Limited.

The first week of July was the second largest week of the year in the matter of factory production, indicating a continued heavy volume of business.

J. J. Bruce of Toronto, has been appointed parts and service manager. He formerly held the same position with Willys-Overland, Ltd.

Great Lakes to Spend $3,000,000

DETROIT—To round out its steelmaking capacity so as to balance blast furnace production, the Great Lakes Steel Corp., Ecorse, is increasing its facilities by about one-third and will spend approximately $3,000,000.

The present operating force of the corporation is about 3800 men and with the increased capacity another 1000 men will be employed. Approximately 500 men are working on construction at the present time.

G.M. Fleet Sales At Three-Year Top

DETROIT—C. E. Dawson, president of General Motors Fleet Sales Corporation, reports that June deliveries of General Motors passenger cars and trucks to large fleet users exceeds any month in over three years.

L.G.S. Has Second Quarter Gain of 70%

INDIANAPOLIS—L. G. S. Devices Corp. reports shipments of 204,466 free wheeling units in the second quarter of this year. This represents an increase of more than 70 per cent over shipments of 119,897 in the same period last year.

W. Carleton Starkey, president, said the plant is working 24 hours per day on a seven day week basis and that the production schedule for June called for 92,000 units, or approximately 50 per cent greater than ever before in the history of the corporation.

Soaring Pound Hits Canadian Importers

Shipments from England Lose Preferences Set-Up by Imperial Conference

TORONTO—With the pound sterling above par in Canadian funds a complete change of mind and developments is noticeable in trade and industrial circles of the Dominion with respect to international business movements. In some quarters the opinion is expressed that nature has undone the work of the Imperial Economic Conference in one short year and that a new basis is necessary for the encouragement of trade between Canada and the United Kingdom.

Quick to take advantage of any situation, the Canadian Government has ruled that the duty on imports from Great Britain must be figured on the currently quoted value of sterling above par and importers are getting it in the neck again. Previously, with sterling at a substantial discount, duty and other excise charges were imposed on the basis of an arbitrary valuation of the pound considerably above the market rate—even at the par value of $4.86 when it was actually around $4.00 or lower. This action has aroused bitter complaint from numerous importers in Canada.

British Advantages Wane

With sterling above par in relation to the Canadian dollar, much of the advantage accruing to Canadian importers of British products has been wiped out even with the tariff concessions granted as a result of the Empire Conference in Ottawa last August. The new situation is looked upon generally as being right back to that of some two years ago and it has become increasingly difficult to do business with manufacturers of automobiles, trucks, motorcycles and other lines in Britain. In fact, conditions have become increasingly favorable for imports from the United States despite tariff barriers.

Canadian importers with scheduled shipments on the way from Great Britain are concerned with the prospect of increasing costs due to monetary developments of recent date and resultant tariff charges of higher nature. Those who had secured complete stocks when sterling was low are sitting pretty, but those who are committed to future deliveries, are showing signs of concern. Higher trade prices can only result.

Dominion Government customs and excise regulations which were created when sterling was at a substantial discount have gone by the boards, but the Government is seeing to it that the Treasury will not lose by immediately adopting new rulings that hit the importers.

W-O Reorganization Hearing Is Postponed

Court Sets July 15 as New Date for Plan Consideration

TOLEDO—After an all-day conference between representatives of the bondholders' committee and the reorganization committee of the Willys-Overland Co., the open hearing in Federal Court here scheduled last Monday was postponed until July 15 at 10 a. m.

Committees sought to compose their differences preliminary to the court hearing but could not make a final agreement.

Conferences were scheduled to be continued in New York later in the week.

It was reported that several constructive suggestions were made to bring about the general approval of the plan.

The conference was likened to a poker game in which various interests were striving to gain advantages. Bondholders would have to make a big assessment upon themselves it is held if they bid the property in at foreclosure because of the prior lien of about $500,000 in taxes. The plan, on the other hand, offers them half in new bonds, a quarter in stock rating with new money put into the company and a quarter as a prior claim on liquidation of assets not to be used in manufacture of motor cars. Betterment of the general real estate market is one of the prime factors in the successful working out of the liquidating corporation.

At a meeting here a few days ago creditors representing more than $1,500,000 in claims approved unanimously the reorganization plan.

An application was made to the court by the receivers for authority to make 5000 more passenger cars. L. A. Miller, receiver, reported that it was now necessary to order steel six weeks ahead to insure deliveries at desired date, and that the additional order would insure operations to mid-November. He reported 2574 men now on payrolls at the plant. Hearing on the application will be Monday at 9.45 a. m. Receivers' attorneys reported practically all of the cars were sold ahead.

Chittenden to Represent Spicer

DETROIT—L. P. Chittenden has been appointed special representative of Spicer Mfg. Corp., Toledo, Ohio.

G.M. Exports Gain 45% in First Half

NEW YORK—Export shipments of cars and trucks from General Motors plants in the United States and Canada during the month of June were 127 per cent greater than in the corresponding month last year. During January and February, 1933, foreign shipments were considerably under 1932, but since March the progress made has been so great that shipments for the first six months of the year have attained a cumulative figure 45 per cent in excess of 1932.

July Production Boost Likely

(Continued from page 79)

reported as at a highly satisfactory low point on average estimate placing total stocks of new cars as around 200,000 to 225,000 as of July 1.

Used car movements have also been progressing satisfactorily with a number of dealer organizations reporting sales of used cars exceeding new car deliveries.

Particularly good reports are coming in from manufacturers of higher priced cars and cars in the upper middle range during the past two or three weeks. In several cases retail deliveries of such cars are still running ahead of shipment with banks of dealers' orders on hand at the factory. Apparently the 3 per cent general sales tax which went into effect in Michigan July 1 is not having serious effects on car sales, according to reports from dealers in this area.

Undoubtedly there was considerable buying in the closing days of June attributable to desire for anticipating and avoiding the tax, but except for this earlier consummation of some sales, the tax so far seems to have developed at the worst into only a minor point of sales resistance since going into effect.

Individual company official reports reveal the following for the week ending July 8:

DeSoto dealers reported deliveries of 466 DeSotos as against 287 a year ago—a gain of 62.3 per cent. Plymouth deliveries in the same period by DeSoto dealers aggregated 1847 cars—a gain of some 290 per cent over corresponding week last year. Used car sales for this group for the week total 2341 cars.

Packard reports new car stocks in dealers' hands as at the lowest point in the past 10 years as the result of accelerated demand in spite of a 50 per cent increase in shipments in June over May. Packard, according to M. M. Gilman, vice-president in charge of distribution, showed an operating profit for both May and June.

Chrysler Sales Corp. report final summary for June shipments as some 93 per cent ahead of May for Chrysler cars alone.

Ford Motor Company reports sales by dealers to consumers for June 19.4 per cent ahead of June last year, a total of approximately 64,000 and representing the biggest month of eight-cylinder car sales since introduction of the eight.

Eight-cylinder commercial car and truck sales during June totaled 2774, an increase of more than 60 per cent over May.

Chevrolet reports total June retail sales of 78,564, bringing retail deliveries for the first six months to roughly 305,000 cars and trucks, compared with 253,000 for the same period last year. June sales also compare favorably with June, 1931, in which 78,117 were sold and with June, 1930, with a total of 73,700.

During the week ending July 8 Dodge dealers sold 2070 Dodges and 1870 Plymouth passenger cars and 558 commercial cars and trucks.

Chrysler Motor sales to dealers up to July 11 have exceeded the total for the entire year of 1932, largely due to showing made by Plymouth and Dodge.

Hudson-Essex sales for the week ending July 8 more than doubled those for the same week one year ago, making the ninth successive week when sales have exceeded last year's figures. According to Chester G. Abbott, general sales manager, July sales to date are running approximately 10 per cent ahead of June, with indications that July total will at least equal last month's showing.

Bohn Aluminum Makes Profit in First Quarter

DETROIT—Bohn Aluminum and Brass Corp., will show a net profit in excess of $500,000 after all charges equal to $1.40 a share for the quarter ended June 30, 1933. First quarter net profit totaled $100,602 or 28 cents a share. Net loss for the first six months of 1932 was $73,964.

Diamond T Truck Orders in June, Greatest in History

CHICAGO—As a result of the continued improvement in business, officials of the Diamond T Motor Car Company announce that orders during the month of June exceeded those of any other month in the twenty-eight year history of the company, and were more than 100 per cent greater than those of June, 1932. July sales up to date are continuing at the highest rate in the company's experience.

Young Orders Up 33%

RACINE, WIS.—Young Radiator Co. reports orders on hand are approximately 33 1/3 per cent in excess of those which were on the books at the same period the preceding year.

Reo Up 45% in June

DETROIT—Reo Motor Car Co. shipped 1032 units during June compared with 712 in the same month last year, a gain of 45 per cent.

N.A.D.A. Forming Council of Association Executives

ST. LOUIS—President Vesper, of the N.A.D.A., is organizing an Executive Advisory Council which will include managers, secretaries, and other administrative executives of automobile trade associations throughout America.

"In forming this group we are getting together the united intelligence and strength of individuals who have rendered a valiant service to the industry, and we can use their combined judgment for the benefit of automobile dealers everywhere, as well as to be helpful to the executives themselves on many projects of particular interest to the group," says President Vesper.

Membership in the Council of the N.A.D.A. is free. N.A.D.A. headquarters will act as a clearing house of information and help promulgate and advance local associations.

Eaton Sponsoring Fluid Flywheel

CLEVELAND — Early consideration by a number of important American automobile manufacturers of the fluid flywheel, now standard equipment on a number of well-known British cars, is reported as probable by Eaton M[illing] Co. which is sponsoring its development in this country.

June Rim Inspections Nearly Double 1932

CLEVELAND—Rim inspection in June totaled 1,015,181 as compared with 532,118 last year, according to the Tire & Rim Assn. In the first six months inspections numbered 4,505,434 as compared with 4,088,600 in the corresponding period in 1932.

Motor Wheel Plans Bigger July Output

LANSING—Production continues to be stepped up at the plants of the Motor Wheel Corp. Although June was the best month since April, 1929, present indications are that July will be even better. Several divisions are operating three shifts day and night.

Continental Motors Shares Relisted by N. Y. Exchange

DETROIT — Continental Motors Corp., Detroit and Muskegon, has reported for six months ended April 30, 1933, net loss of $1,432,918 after taxes, depreciation and charges, as compared with a net loss of $1,026,660 in the corresponding period of the preceding fiscal year. The New York Stock Exchange has relisted the stock of Continental Motors Corp.

Emory O. Penry, Auburn vice-president, whose death was reported in Automotive Industries last week

Twenty New Members Elected by M.E.M.A.

Sherin Named Head of Chemical Group

NEW YORK—Directors of the Motor & Equipment Manufacturers Association, at their meeting in New York on June 27, formally approved membership applications of 20 manufacturers received by the Association since the last board meeting in January. Following are the companies approved:

Automotive Gear Works, Inc., Richmond, Ind.; Acme Air Appliance Co., Brooklyn, N. Y.; Brown Co., Berlin, N. H.; Edw. G. Budd Mfg. Co., Philadelphia, Pa.; Cedar Rapids Engineering Co., Cedar Rapids, Iowa; Egyptian Lacquer Mfg. Co., New York, N. Y.; Huffman Mfg. Co., Dayton, Ohio; Keasbey & Mattison Co., Ambler, Pa.; Machine Specialty Co., Ann Arbor, Mich.; Murray Rubber Co., Trenton, N. J.; Philco Radio & Television Co., Philadelphia, Pa.; P. O. B. Mfg. Co., Cincinnati, Ohio; Precision Parts Co., Ann Arbor, Mich.; Powell Muffler Co., Utica, N. Y.; Raytheon Production Corp., New York, N. Y.; Simplex Piston Ring Sales Co. of America, Cleveland, Ohio; Soss Mfg. Co., Roselle, N. J.; Superior Piston Ring Co., Detroit, Mich.; Trindl Corp., Aurora, Ill.; York Corrugating Co., York, Pa.

Directors also approved the selection of G. W. Sherin of the E. I. DuPont de Nemours & Co., Wilmington, Del., as chairman of the NEMA Chemical Manufacturers Group, and of J. M. Spangler, National Carbon Co., New York, N. Y., as a member of the NEMA Wholesalers Relations Committee.

Steel Production at 80% of Normal Rate

Enters Second Half With Biggest Backlog in Year

NEW YORK—The leading steel producer's unfilled tonnage statement, as of June 30, which revealed a backlog of 2,106,671 tons, served to put statistical emphasis on the recent expansion of steel buying in which automotive consumers continue to set the pace. Not only were the unfilled obligations the heaviest in point of tonnage in a year and sufficient to keep the corporation's capacity employed until the latter part of September at the average June operating rate, but much of the backlog must of necessity consist of contracts against which specifications have been furnished, because no third-quarter contracts were accepted last month and all tonnage not specified against by June 30 was considered cancelled.

The latest official figures of the American Iron and Steel Institute report steel ingot production last month as having been at an average rate of 45.96 per cent of capacity against 34.11 per cent in May and 16.23 per cent in June, 1932. Impressive as the steel industry's recovery in the last three months has been, especially so as this has been the first June in five years to show a production increase, market observers see little advantage in painting the lily white.

Present statistics are based on an ingot capacity of around 68,000,000 tons. The peak of actual production was 55,000,000 tons in 1929. This week's rate of operations is estimated at 56 per cent of ingot capacity. This means, in fact, 70 per cent of the highest rate of production ever attained and, assuming a 45,000,000 ton year to be a normal one, if there is such a thing, it means that the steel industry is now operating at approximately four-fifths of its rate in what have been recorded as good steel years.

One veteran market observer is of the opinion that this confusion in steel statistics should not be permitted to give a distorted picture of the steel industry's recovery to the powers that be at Washington. On the subject of prices, no new developments are to be recorded, save that there is talk of an impending rise in wire rods and manufacturers' wire.

Pig Iron—All markets rule firm. Seaboard competition with foreign iron has considerably abated under the influence of higher dollar prices on "to arrive" shipments because of the exchange situation.

Aluminum—Automotive demand for both virgin and remelted metal continues to broaden. Prices unchanged all along the line.

Copper—While looking for copper to go to 9¼c., delivered Connecticut Valley before long, producers were freely offering metal at 9c. early this week, without domestic demand being very brisk.

Zinc—At 4.85c., East St. Louis, the market turned quiet. Tightness in the ore supply and higher demands on the part of miners are at the bottom of the recent advances.

Studebaker Has April-May Operating Profit after $3,156,206 Loss in First Quarter

Receivers Report $1,100,000 Increase in Cash in June Quarter—Sales Maintain Sharp Upward Treend Since March—Current Ratio 4.3 to 1

SOUTH BEND — An operating profit for April and May of $68,941, before depreciation but after non-recurring items totaling $136,258, was reported this week by Studebaker receivers Bean, Hoffman and Vance in the first published account of their stewardship of the corporation's affairs. Sales of Studebaker and Rockne cars and trucks have moved steadily upward from 2045 in March to 3798 in April, 4120 in May and 5050 in June.

The receivers report that June is expected to show a further increase in operating profits and that cash on hand June 30 was approximately $1,100,000 more than on March 31, 1933.

Simultaneously with the release of the report on April and May operations, the corporation's income account for the first quarter and March 31 balance sheet were made public. The income account shows net sales of $7,228,860 in the first three months of this year on which the net operating loss was $1,329,067. Depreciation, etc., of $517,246 and interest paid of $200,285 increased the deficit to $2,046,598 of which 92.5 per cent was sustained before the receivership. The corporation's share of White company's loss for the quarter was $1,022,845 and of the Pierce-Arrow deficit $86,764, making the consolidated net loss for the quarter $3,156,206. This total and in addition $2,633,901, representing a revaluation of assets for receivership estate, were deducted from the earned surplus account.

A comparison of a number of items on the March 31, 1933, balance sheet with the Dec. 31, 1932, balance sheet after eliminating White and Pierce-Arrow follows:

	March 31, 1933	Dec. 31, 1932
Current assets	$7,566,830	$10,897,751
Current liabilities	1,751,057	8,924,611
Working capital	5,815,773	1,973,140
Cash	1,038,002	2,025,203
Cash in closed banks less res.	194,211	.....
Marketable investments	9,216	10,792
Inventories	4,875,076	6,991,607
Sight drafts, rec. net, etc.	1,450,326	1,870,150
Notes payable	275,710	5,591,000
Accounts payable	413,500	1,394,135
White Co. investment	30,644,038	.....
Pierce-Arrow investment	4,347,512	.....

Claims against the Studebaker and Rockne companies in receivership as of March 31, 1933, are listed as follows:

Bank loans	$3,744,022
Accounts payable	2,333,277
Accruals	990,149
Res. for material com. cancel.	244,319
Gold notes due Dec. 1, 1942	14,861,050
Total claims	$22,172,816

Net worth is shown at $69,816,001 and plant and equipment less depreciation is carried at $49,625,321, which book value the receivers consider to be substantially in excess of actual value.

New Owner to Start Work In Durant Plant Soon

LANSING—The huge Durant plant which last week was ordered sold to a buyer represented by R. H. Curtiss, Detroit attorney, for $450,000, is expected soon to be humming with activity. Mr. Curtiss estimates that between 1500 and 2000 will be employed within six months. It is reliably reported that the real purchaser is a large manufacturing company which will centralize its activities, which are now divided among 10 plants scattered over the country.

Joint Committee Named for Chicago Parts Show

CLEVELAND—The joint show committee of the M.E.M.A., M.E.W.A. and N.S.P.A. will hold its first meeting late in July to discuss plans for the annual trade show to be held in Chicago during week of Oct. 29. The members of the committee are: M.E.M.A. manufacturers, Mason T. Rogers, Multibestos, F. C. Bahr, Arrowhead, and N. H. Boynton, National Lamp Works of General Electric; N.S.P.A. manufacturers, D. W. Rodger, Federal-Mogul, Burke Patterson, Thompson Products, and Leo F. Hunderup, Van Norman, and jobbers, R. H. Bachman, Allentown, Pa., and C. F. Schroth, Akron; M.E.W.A. jobbers, Elton Seager Cleveland, and Roy Shreiner, Harrisburg, Pa.

Oldsmobile Exonerated In Freight Rebate Case

DETROIT—Judge Tuttle, in the Federal Court for the Eastern District of Michigan, Southern Division, has set aside the verdict of guilty under an Elkins Act anti-rebate indictment in United States of America vs. Olds Motor Works, and has granted a new trial.

From an examination of the Judge's order, it appears that the Judge not only granted a new trial but stated he had erred in his conclusion and in his instructions to the jury as to the proper construction of Rule 34 of the Official Classification. By reason of this error, the motor company was found guilty on 30 counts.

The Judge now states that there is no dispute about the facts. The Olds Motor Works followed the correct procedure in ordering cars 36 ft. 6 in. long and the 10,000 lb. minimum was correctly charged on the longer cars furnished by the railroad, through their inability to furnish cars of the length ordered, all of which is in accordance with the published tariffs.

B. & S. Making New Oil Filter for Nash Cars

MILWAUKEE—Briggs & Stratton Corp., manufacturer of locks, switches, windshield wipers and other automotive appliances, has placed in quantity production a newly developed product, namely, an oil cleaner, already adopted as original equipment by Nash. Output has been stepped up to 1000 units daily and has given employment to about 25 additional workers.

The oil cleaner works on the piston action principle. The cleaning element is something new in this field, being an especially prepared wool fiber which forms a resilient mass of fine screens which are motivated by the varying oil pressures. In so doing, the accumulated dirt caught in the screens is distributed and the life of the product prolonged. Wool fiber is used because it is not affected by temperature or pressure and will not rot, puncture or channel, it is explained. With increased production in other divisions of the plant, Briggs & Stratton is now employing 560 workers.

Lansing Employment Rises

LANSING—Employment in the automotive industries of Lansing showed the largest increase during June for any month since 1929. An average of 7786 men were employed in the major plants during June, which compares with 7175 during May, and 6594 in June, 1932. The Oldsmobile and Fisher Body plants employ in excess of 3000, while Reo lists over 2000 on the payroll, and Motor Wheel more than 1500. All are on a full-time basis.

M.E.W.A. Names Two

CHICAGO—Frank G. Stewart and E. M. Lewis, wholesalers in Washington, D. C., and Dayton, Ohio, respectively, have been added to the Industrial Recovery Act Committee of the M. E. W. A., thus increasing its membership to five.

Indianapolis Rules Meeting

DETROIT—Rules and specifications for the 1934 Indianapolis Race were scheduled for discussion at a meeting called for July 14 in this city.

Charts Help Jobbers Check Distribution

M.E.W.A. Publishes Chart Service for Wholesalers

CHICAGO—A graphic cross section of manufacturer distribution through automotive jobbers is presented in the new Distribution Chart Service compiled by the Motor & Equipment Wholesalers Association.

The purpose of the Distribution Chart Service is stated as "designed to provide for jobbers a convenient method of checking a manufacturer's distribution through jobbers included in the chart service, and of providing for them means of direct contact with other jobbers handling a given line of merchandise."

Four points of value in the use of the charts are listed as being:

1. If a jobber is giving consideration to a new line, he can by reference to the Chart find out those who are handling the line and he may, if he wishes, call upon them to ascertain their experience with the line under consideration.
2. If a jobber has an overstock of a certain line, he may offer the overstock to those carrying that line as shown by the Distribution Chart.
3. A jobber may, through exchange of certain items in a line, balance his stock and at the same time assist a fellow jobber in doing the same.
4. If a jobber is having difficulty in profitably merchandising a line, he may, if he wishes, by reference to the Chart inquire of fellow jobbers if they are facing or have faced a similar situation and how they have met the difficulty.

Used Car Prices Maintained Better

CHICAGO—Improvements in the used car market, including a more active demand and lowered inventories, are reflected in the 76th edition of the Blue Book and Red Book just issued by the National Used Car Market Report, Inc. Considerably less than the normal range of depreciation is shown since the previous edition current during the preceding quarterly period, April, May and June.

Joseph Kent-Smith

DETROIT—Joseph Kent-Smith, metallurgical engineer, died in Battle Creek July 7, following an illness of several weeks. Mr. Kent-Smith came to the United States from England in 1906 to assist in the development of the vanadium steel process. The Vanadium Co., later known as the Vanadium Corp. of America, was organized, and for three years Mr. Kent-Smith was identified with their laboratories. In England during the World War he conducted considerable investigation in radium, and then turned to research on special alloys for the British Government, for which he received the Order of the British Empire from the King.

He returned to America in 1925 and aided in the development of a process for making granular iron, for C. Harold Wills, and also became consulting metallurgist for the Climax Molybdenum Co. of New York.

Studebaker Exports In Big Up-Swing

SOUTH BEND—June exports of Studebaker, Indiana and White trucks and buses set a new record for 22 months, and shipments of Studebaker and Rockne passenger cars exceeded May of this year and surpassed June, 1932.

Total exports of commercial units for the first six months are 47 per cent ahead of the same period last year, and 42 per cent ahead of the last half of last year. Passenger car exports for the month exceeded June, 1932, and showed a gain of 23½ per cent over May of this year. Total June business, including shipments of Studebaker cars, Rockne cars, Studebaker trucks, Indiana trucks and buses and White trucks and buses, showed an increase of 41 per cent over May, and a gain of 34.2 per cent over June, 1932.

CALENDAR OF COMING EVENTS

SHOWS

Int. Assoc. of Show and Assoc. Managers, Chicago ..... July 24-25
Eastern States Exposition, Springfield, Mass. ..... Sept. 17-23
Natl. Assoc. of Motor Bus Operators, Chicago ..... Sept. 21-22
National Metal Exposition, Detroit ..... Oct. 2-6
Joint Trade Show, N.E.M.A., N.S.P.A., N.E.W.A. ..... Oct. 30-Nov. 4
New York Automobile Show, Jan. 6-13, 1934
Chicago Automobile Show Jan. 27-Feb. 3, 1933

CONVENTIONS

National Metal Congress, Detroit ..... Oct. 2-6

MEETINGS

S.A.E. International Automotive Engineering Congress, Chicago Aug. 28-Sept. 4
American Chemical Society, Chicago Sept. 11-15
American Transit Assoc., Chicago Sept. 18-20
Natl. Safety Council, Chicago.... Oct. 2-6
National Metal Congress, Detroit. Oct. 2-6
American Petroleum Institute, Annual, Chicago ..... Oct. 24-26

June Biggest G. M. Month in Two Years

Total Sales Top Last Year by 116%—Dealer Stocks in U. S. Decline

NEW YORK—June sales of General Motors cars and trucks to consumers and to dealers in the United States were the largest in two years. Total sales, including Canada and overseas shipments, reached the highest level since May, 1931.

Domestic retail sales in June numbered 101,827, a gain of 78 per cent over last year and of 30 per cent over May, 1933. For the first six months total sales to U. S. consumers amounted to 399,764 as compared with 345,574 in the same period in 1932.

Sales to U. S. dealers in June amounted to 99,956, reflecting a decrease of nearly 2000 units in dealer stocks and representing a 95 per cent gain over last year and an increase of 16 per cent from May. First half sales to U. S. dealers were 427,762 against 341,571 a year ago. Dealer stocks increased during the period by about 28,000 units.

Including Canada and overseas with the U. S. figures, June sales to dealers totaled 113,701, an increase of 16 per cent over May and of 116 per cent over June, 1932. For the six-month period, total sales were 498,622 against 394,915 last year, an increase of 26 per cent.

Wisconsin Gets U. S. Order

MILWAUKEE — Wisconsin Motor Co. has received a $75,000 Government order for tractor engines for use in forestry work and has recalled nearly 100 employees and made lengthening of working hours possible. The company also reports a relatively excellent initial demand for its newly developed air-cooled portable engine for general utility work on farms.

Hastings Promoted by Rusco

MIDDLETOWN, CONN.—G. A. Hastings has been elected secretary and treasurer and a director of the Russell Manufacturing Co. Sales Division, manufacturers of Rusco brake linings and other automotive products, and the Russell Manufacturing Co., Ltd. Mr. Hastings, who is also comptroller of the Russell Manufacturing Co., succeeds P. J. Goldner, who has resigned both positions.

Timken Raises Wages

CANTON, O.—Effective July 1, Timken Roller Bearing Co. increased wages 11.11 per cent. Employment in the company's plants has increased from about 1700 in March to 4000.

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

Disc Lapper For Cemented Carbides

The Porter-Cable Machine Co., Syracuse, N. Y., has brought out the Type D-4 disc type lapping machine for finishing the edge of cemented-carbide tools. It is available with a sliding carriage for fixed lapping;

Porter-Cable disk-type lapping machine

also without the carriage for free hand work. Radius lapping is made possible with simple attachments. The machine is portable but may be fixed if desired.

The disc is of special cast iron and is 15 in. in diameter. A copper disc is supplied as extra equipment.

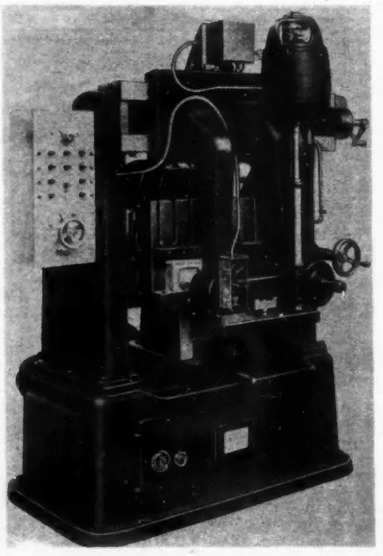
In general, the lapping on the cast-iron or copper disc is accomplished with a grinding compound such as Carborundum grading R40 fine, and is sufficient to produce a sharp edge and eliminate all chips and grinding marks. If a finer finish is desired, the same compound may be used on the wooden disc. This grade of compound leaves a dull mat finish from the cast-iron lap and a semi-polish finish from the wooden lap. The wooden disc of white wood or mahogany is approximately half the diameter of the cast-iron disc on which it is mounted. The object of the wooden disc is to provide a softer lap for finishing, and by the use of this combination disc, a faster cutting compound can be used in the first operation.

The electric motor is rated at half hp. 1200 r.p.m. for 60 cycle AC or DC current. Net weight is 200 lb. with the adjustable carriage.

120 Inches in One Setting

An electrically controlled automatic die-cutting and profiling machine has been developed recently by the Curd Nube Machine Co., Hisgen-Nube-Watford Division, Chicago, Ill. It is constructed for large and heavy work, on blanking and forming dies, for cutting of fender and body dies. For this purpose the Hisgen-Nube-Watford Co. have built a special 120-in. A.G.F.E.-4, which will cover an area of 120 in. in one setting.

A smaller machine which covers 24 x 18 in. is suitable for cutting of bakelite and die-casting molds. All sizes will reproduce from a soft model or pattern made of wood or plaster. All motions of the machine are effected by special reversing motors, incorporating a dynamic brake. All motions are automatically controlled by the tracer mechanism, when automatic operation is desired. Semi-automatic operation is possible by means of the push-button control cabinet placed immediately in front of the operator. Hand control is also available.



H-N-W automatic diesinking and profiling machine

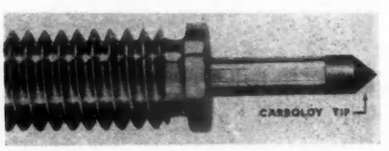
The bed carries the table and die and pattern holders which are moved by a feed screw to bring the work nearer to the tracer and cutter. This primary motion is controlled by hand-wheel adjustments.

As all motions are effected by separate motors, the cutter is forced to enter the die-block and take very heavy cuts if desired, entirely independent of the sensitiveness of the tracer, which controls only the confines of the form or contour to be cut, or transferred from the model. Five sizes of machines are built. The first has capacity as follows: Maximum length of die, 16 in.; maximum width of die, 12 in.; maximum thickness of dieblock, 12 in.

AGFE-1 24 x 18 x 24 in.; next size is 56 x 32 in.; AGFE-3 is 75 x 56 in.; the AGFE-4 covers a total area of 120 x 108 in., and will take a die-block of 150 in. in thickness.

Tips Increase Life of Hydraulic Valve Stems

The latest use of Carboloy is its application as wear resistant inserts on hydraulic valve stems and seats, according to an announcement recently received from Carboloy Co., Inc.,

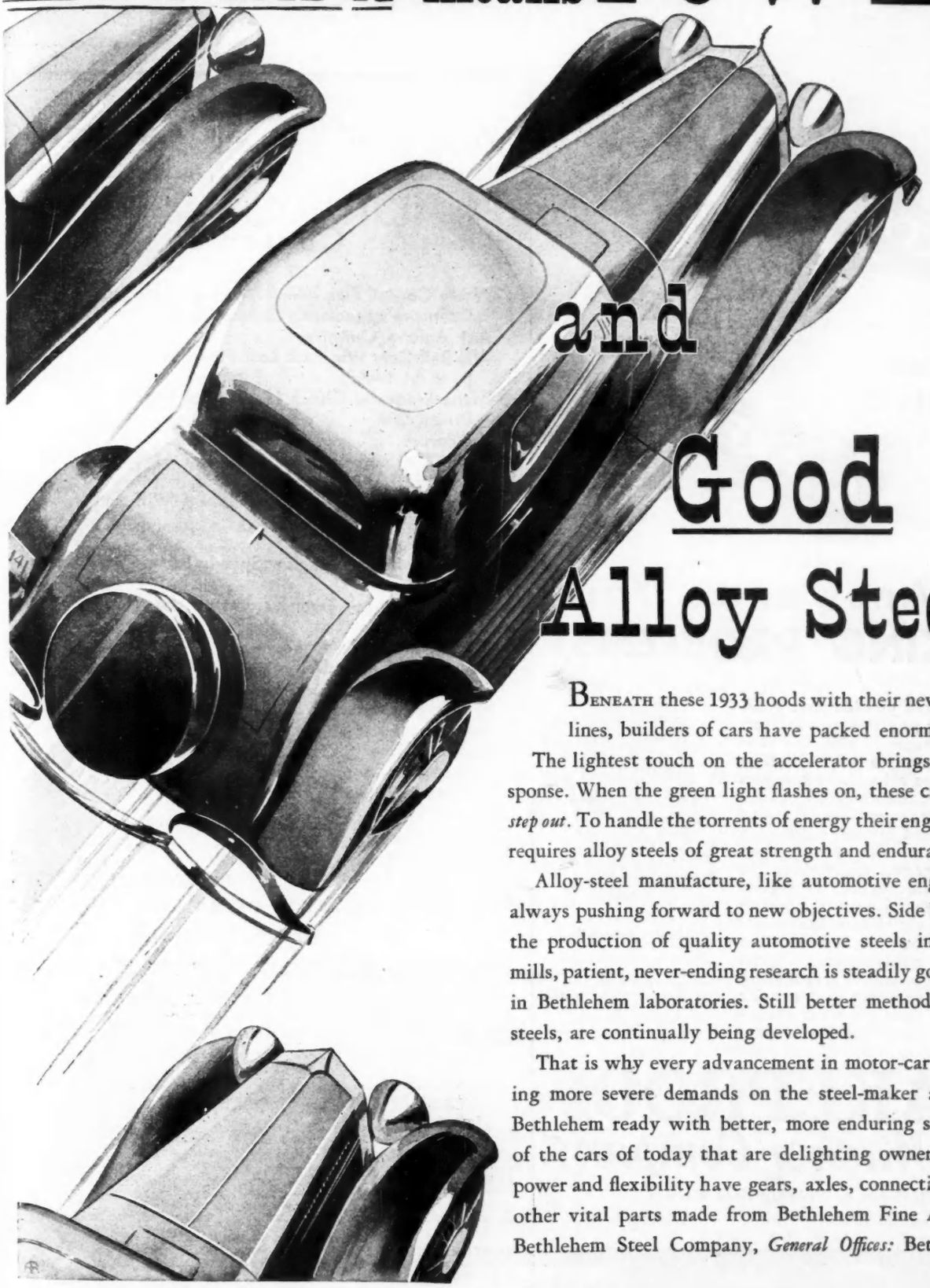


Carboloy tipped valve stem

Detroit, Mich. Valve stems and seats in hydraulic presses, pumps, rams, etc., are subject to such high abrasion and pressure that frequent replacements are necessary to insure accurate pressure control. By tipping these stems and seats at their wear-points with Carboloy, it is claimed that accurate pressure control is provided over long periods of uninterrupted use, less maintenance expense is incurred and replacement costs are substantially reduced.

Carboloy is applied to valve stems and seats by brazing a small piece or blank to the section of the shank which is subject to wear. On the valve stem it replaces the steel at the point-end only. On the valve seat, a ring of Carboloy occupies the section which the valve stem contacts. In both cases sufficient material is provided for regrinding and repeated use.

GETAWAY means POWER and Good Alloy Steels



BENEATH these 1933 hoods with their new, sweeping lines, builders of cars have packed enormous power. The lightest touch on the accelerator brings instant response. When the green light flashes on, these cars of today *step out*. To handle the torrents of energy their engines deliver, requires alloy steels of great strength and endurance.

Alloy-steel manufacture, like automotive engineering, is always pushing forward to new objectives. Side by side with the production of quality automotive steels in Bethlehem mills, patient, never-ending research is steadily going forward in Bethlehem laboratories. Still better methods, still finer steels, are continually being developed.

That is why every advancement in motor-car design placing more severe demands on the steel-maker always finds Bethlehem ready with better, more enduring steels. Many of the cars of today that are delighting owners with their power and flexibility have gears, axles, connecting rods, and other vital parts made from Bethlehem Fine Alloy Steels. Bethlehem Steel Company, *General Offices:* Bethlehem, Pa.

BETHLEHEM STEEL

BETHLEHEM *Fine* ALLOY STEELS